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the OIL AND GAS JOURNAL

JANUARY 26, 1959

What the 5% wage hike will cost
p. 97

Annual

REVIEW FORECAST

NUMBER

The Journal sees . . .

Drilling up 8.4% or 3,635 wells

Domestic demand gain of 4.7%

Production up 7.9%—a new record

Capital investments above $7 billion

Gas-liquids production up 5.8%

15,500 miles of new U. S. pipelines

Starts p. 119

EXTRA THIS WEEK

PETROLEUM PANORAMA

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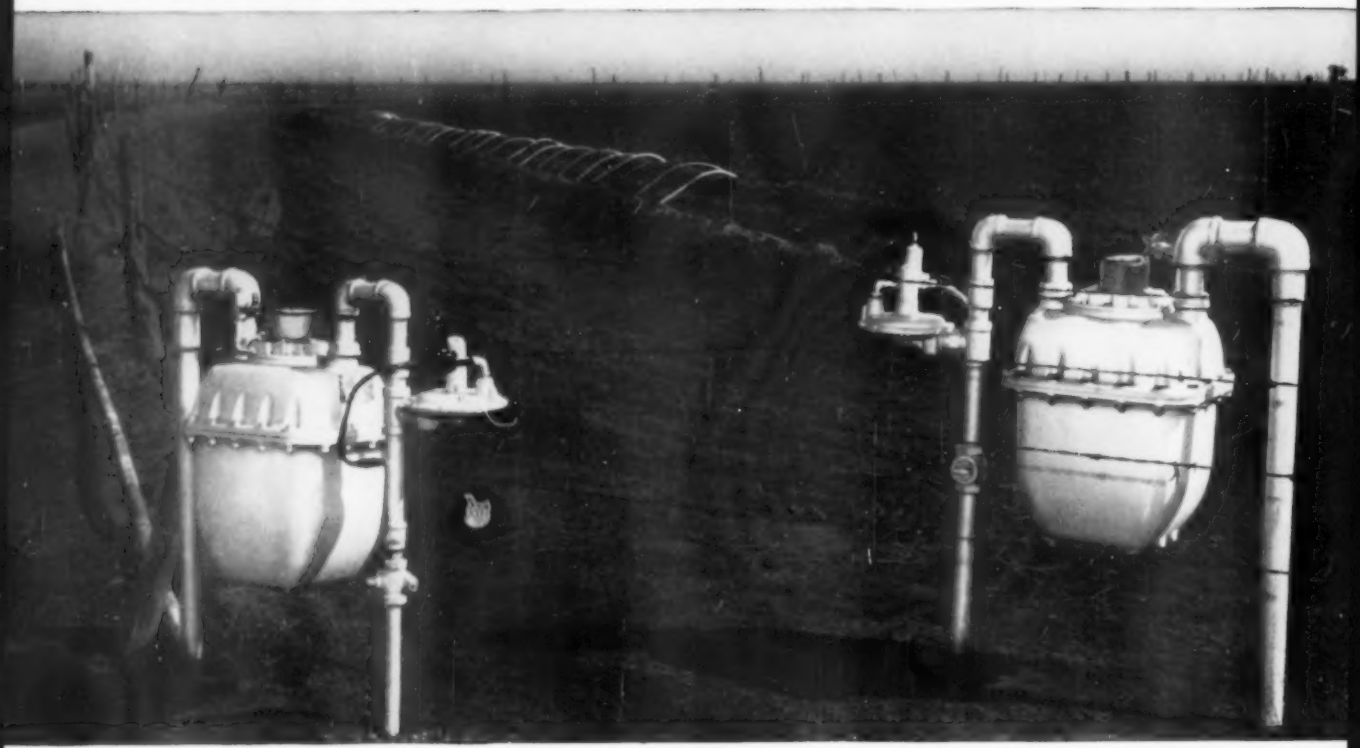

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the OIL AND GAS JOURNAL Newsletter

Tulsa, Okla.
Jan. 26, 1959

Drilling will pick up this year after two bad years:

The industry should drill 52,746 wells in 1959, a gain of 7.4% over the 49,111 wells completed in 1958 (See special section beginning on p. 120).

This prediction is based on reports from operators in all active fields. Operators say they will drill 10,820 wildcats and 41,926 development wells. This means a 12.8% gain for wildcatting and a 6.1% gain for development drilling.

Drilling outlook is affected by two factors:

...Production gains. If these prove greater than anticipated, drilling programs may be increased even more.

...Flow of exploration capital abroad. In past 2 years, heavy spending abroad has hurt domestic drilling. Extent to which this continues will determine future drilling at home.

Other signposts for 1959:

...Demand: It'll total 9,461,000 bbl. daily domestically, a gain of 4.7% or 425,000 bbl. daily. Gasoline demand will average 4,000,000 bbl. daily for the first time.

...Imports: Reached all-time high of 1,654,000 bbl. daily in 1958, a 5% gain. Total imports now represent 24.7% of U. S. crude production. Crude imports dropped 7.4% but products gained 28.1%.

...Production: Record crude output is the prospect this year after a tough 1958 when crude production dropped 464,000 bbl. daily, representing $500 million loss to producers.

...Refinery runs: Should be about 8,120,000 bbl. daily for the first time. Gas-liquids production also should rise 5.8% on basis of greater oil output.

...Prices: Erosion of prices hurt all segments of the industry in 1958. They should firm up this year based on corrected inventories, better supply-demand balance, and outlook for better demand.

...Pipelines: Prediction is construction of 12,500 miles of new gas lines, 2,000 miles of crude lines, and 1,000 miles of products lines. It's good gain for gas, a decline for the others.

...Capital outlay: Should reach $7.028 billion during year compared with $6.389 billion last year.

Price cuts again are chipping away at producer income.

Study shows that since October price cuts averaging 8.75 cents a barrel have been posted on 1,287,050 bbl. daily of the nation's crude. The net loss to producers is $94,718 per day.

Price cuts in last 16 months have cost producers more than $800,000 daily.

This is not the whole loss story. Also consider that proration or market restrictions have reduced production and thus cut income from another direction (p. 103).

▼ ▼ ▼

Sale to Russia of 12,000 tons of 28 and 30-in. pipe has been turned down by Commerce Department.

Application by an unidentified American firm was rejected on strategic grounds.

This came to light last week after Soviet Premier Mikoyan was quoted as saying 12,000 "miles" of U. S. pipe might be purchased by Russia.

Unclear is whether Russia wanted "miles" or "tons" of big pipe. Anyway Commerce turned down deal because of pipe diameter and not amount. Pipe more than 24-in. diameter is subject to strict export controls because of its strategic value.

Good omen: Members of National Constructors Association report pickup in sales activity in past several months.

This is true in both talking and contract-signing stages, and means increased engineering activity during early part of the year. It will be reflected later in actual construction.

Association represents big engineers of chemical plants, refineries, power plants, steel mills. These members report two construction trends for 1959:

...Foreign work will be an even more important market for U. S. engineering and construction services.

...Domestic work may center mostly on modernization programs rather than expansion projects.

▼ ▼ ▼

New southern Michigan discovery confirms a 12-mile trend running northwest from northern tip of Scipio field (p. 108).

It's Turner 1 Blair in Jackson County which flowed 265 bbl. daily on 10/64-in. choke from Trenton dolomite at 3,832 ft.

Activity is certain to pick up in area especially since Aurora is studying plans for 70-mile crude line to Detroit refinery from the area.

Spots to watch in the Rocky Mountain region:

...San Luis Valley of Colorado where TGT wildcat will enter one of the region's "last frontiers" for exploration. Well will be 9,000-ft. test to the Cretaceous.

...Utah's northwest Paradox basin where TGT also plans

wildcat to test promising Pennsylvanian reefing uncovered in Poison Springs area of Garfield County.

...Arizona's Black Mesa basin where Lion Oil and others plan tests over a wide area.

Biggest gas structure in West Texas has been extended.

Standard of Texas stepped out 1¼ miles on northeast side of Puckett field in Pecos County, got a 10,250 M.c.f. daily Ellenburger well. Pay is 400-ft. section near 15,000 ft.

▼ ▼ ▼

Template-type drilling platforms likely will appear next year or so in California coastal waters.

Unlike those used in Gulf Coast, the platforms will rest on piles which have been drilled in and not driven. A new method has been developed which looked good in recent tests.

The new idea stemmed from experience with California Standard-Humble caisson-type platform offshore from Summerland. Some 25 days were spent in jetting the 27-ft. diameter caissons through 25 ft. of overburden. More of this type will be used where there's adequate overburden. But where the ocean floor is clean and hard, look for the template type to see use.

▼ ▼ ▼

DeSoto engineers are working on an "idea car" driven by four high-speed electric motors receiving energy from a fuel cell.

Chemical interaction of hydrogen and oxygen gases in the cell generate the electric current to drive the motors, one geared directly to each wheel.

Fuel cell is already in development stage and promises to produce power comparable to present day cars with the added advantage of power recovery and fuel economy.

▼ ▼ ▼

Bolivia will get a good exploration play.

Travelers back from that country report preliminary geophysical and geological work is picking up, some drilling also is under way.

The Bolivian pipeline from Sicasica across the Andes to Chile's port of Arica on the Pacific is completed and awaits only formal inauguration.

It means if oil is found in quantity in Bolivia, markets both in Argentina and on the Pacific coast can be served.

The exploration situation: Chaco Petroleum is preparing to test its 2 Agua Salade after setting casing at 4,000 ft. and is preparing to start third test. It has five surface geological crews working...Gulf has abandoned 2 Mandeyapecua at 6,500 ft. in southeastern zone. First was abandoned at 11,600 ft. after show at 7,000 ft. in thin sandstone. Third

test is being prepared. Company has two geophysical crews in the area and plans to move another rig in from Barbedoes in midyear...Bolivian Oil will get a test started within a few months when Big Chief Drilling Co. gets a rig on location. Big Chief also has contract to work for YPFB...Others are all doing aerial, surface, and seismic work on their concessions ...YPFB is using $6.5 million credit extended in deal with Bolivian Oil to buy four American-made rigs for 1959 delivery. It has 10 rigs now but averages keeping four busy at a time due to layoffs and lack of replacement parts.

▼ ▼ ▼

Laurel Pipe Line may extend its 14 to 24-in. products system in the East.

The line is just completed from the Philadelphia refining area to Cleveland. Extensions reportedly now being considered are to Rochester, Baltimore, and Washington.

Columbia Gulf Transmission (formerly Gulf Interstate) plans further automation of its Louisiana-West Virginia gas line this year.

The new engine-driven centrifugal stations were placed under remote control last year.

The original reciprocating stations will be automated this year. The units will go on and off the line automatically according to throughput requirements. It will mark another milestone in gas-pipeline automation.

A new 2-cycle compressor engine with fuel economy equal to 4-cycle engines will be produced this fall.

The engine is rated at 6,200-6,400 B.t.u. per horsepower-hour. It will give the angle-type compressor unit used in gas transmission the fuel economy of the 4-cycle power unit.

The Texas-to-Florida pipeline is within sight of Miami terminus. Gas deliveries won't start until June but a $41-million expansion of compressor capacity is planned (p. 100).

▼ ▼ ▼

Industry trends:

The 5% wage increase offered OCAW by Sinclair is becoming the industry pattern. It already has spread to all segments of the industry except drilling. Widespread union acceptance is expected to start developing soon. Additional cost will be $127,900,000 a year.

Methane Pioneer is ready to sail for England with first overseas cargo of liquid methane. A successful voyage will open new markets for the gas industry. One development worth watching: Liquid-gas storage may supplement underground storage in helping gas utilities meet peak loads.

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Good Wells Make Good News

A Monthly Report on Wells That Are Now Worth More

January 26, 1959

Acidizing is frequently an efficient way to stimulate production from low solubility sands. Here are four recent treatments of this type by Dowell:

- **Carbon County, Wyoming** (New Oil Well) Perforations into Tensleep sandstone were from 6900 to 7000 feet. This formation exhibited about 30 per cent Mud Acid solubility. Initial production was 492 bopd through ¼-inch choke, so fracturing was not necessary. However, operator wanted to clean up bore hole, so Dowell injected a 500-gallon spearhead of Mud Acid. Then 1500 gallons of acid with surface tension reducing, demulsifying and silicate control agents completed the treatment. After clean-up, production stabilized at 1100 bopd through ¼-inch choke. The $1366.00 treatment was paid out in less than two days.

- **Avoyelles Parish, Louisiana** (Old Oil Well) This well was originally completed in the Sparta sand. Production had gradually declined to 30 bopd even though the well had been acidized several times. Dowell recommended Mud Acid to dissolve and disperse any silt that might be plugging perforations. When the well could not be loaded with oil, 25 ball sealers were dropped into the tubing to seal off the thief zone. Then 500 gallons of Mud Acid was pumped into the well, followed by 38 more ball sealers and another 500 gallons Mud Acid. Pressure increases after each injection of balls indicated that additional perforations were being reached. After treatment, production stabilized at 55 bopd. The entire treatment cost of $828.00 was paid out in eight days.

- **Hughes County, Oklahoma** (Old Oil Well) Original completion in 1924 was by nitro-shooting in the open hole. Pay is the tightly-cemented calcareous sand of the Union Valley Cromwell formation which usually responds well to acid. Dowell treated the well with two 3000-gallon stages of regular acid. A temporary plugging agent was injected between the two stages to plug off the most permeable zone. After clean-up, production stabilized at 40 bopd.

- **Hidalgo County, South Texas** (New Gas Well) This well was completed through perforations in the shaly Frio sand. Operator suspected that mud damage to formation was limiting flowing pressure. Dowell recommended acidizing with 1000 gallons super Mud Acid. After treatment, well head pressure rose from 500 to 1500 psi through ¼-inch choke. A planned fracturing treatment was considered unnecessary in view of the excellent results obtained with Mud Acid.

Dowell has the experience, the men and the chemicals needed to acidize your well successfully. For prompt service, call any of the 165 Dowell service points. In Canada, call Dowell of Canada, Ltd.; in Venezuela, United Oilwell Service. Dowell, Tulsa 1, Oklahoma.

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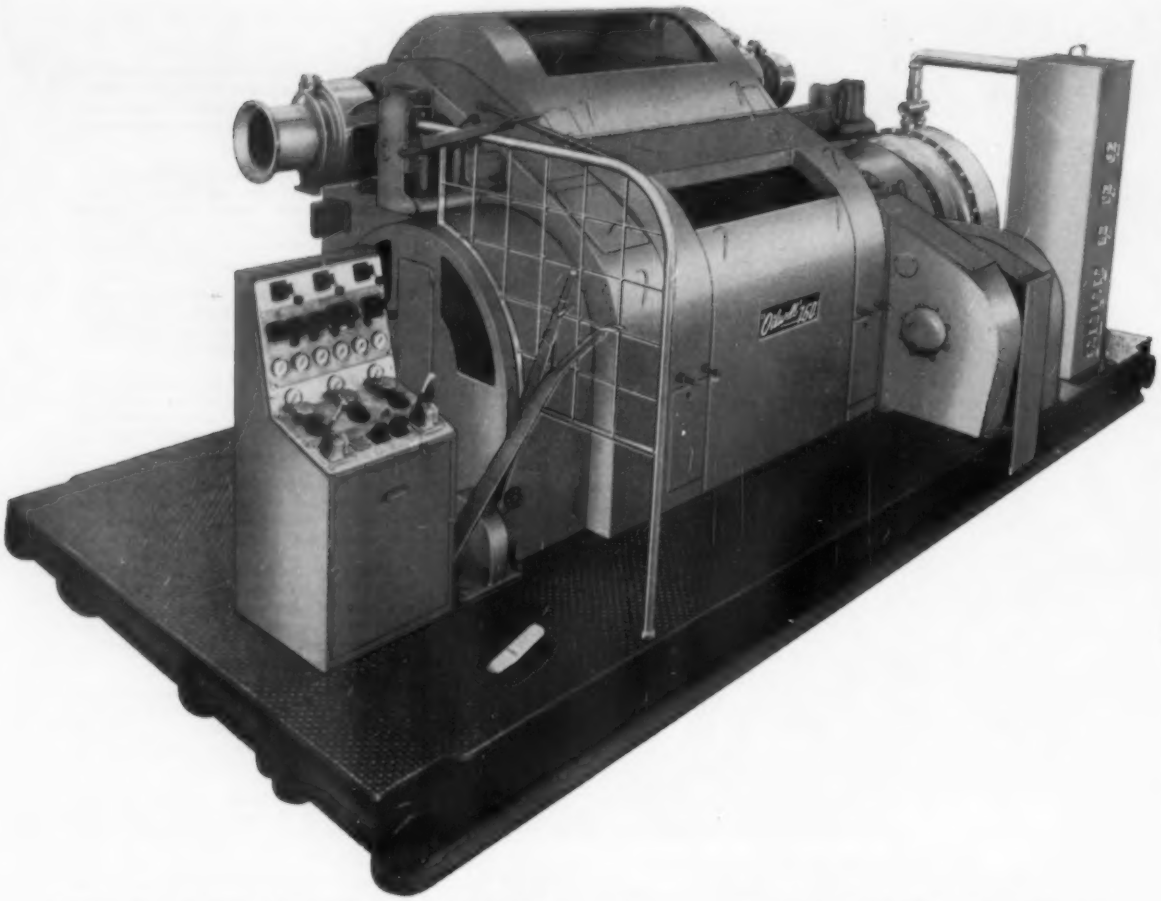

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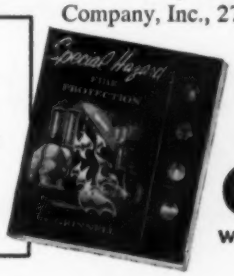

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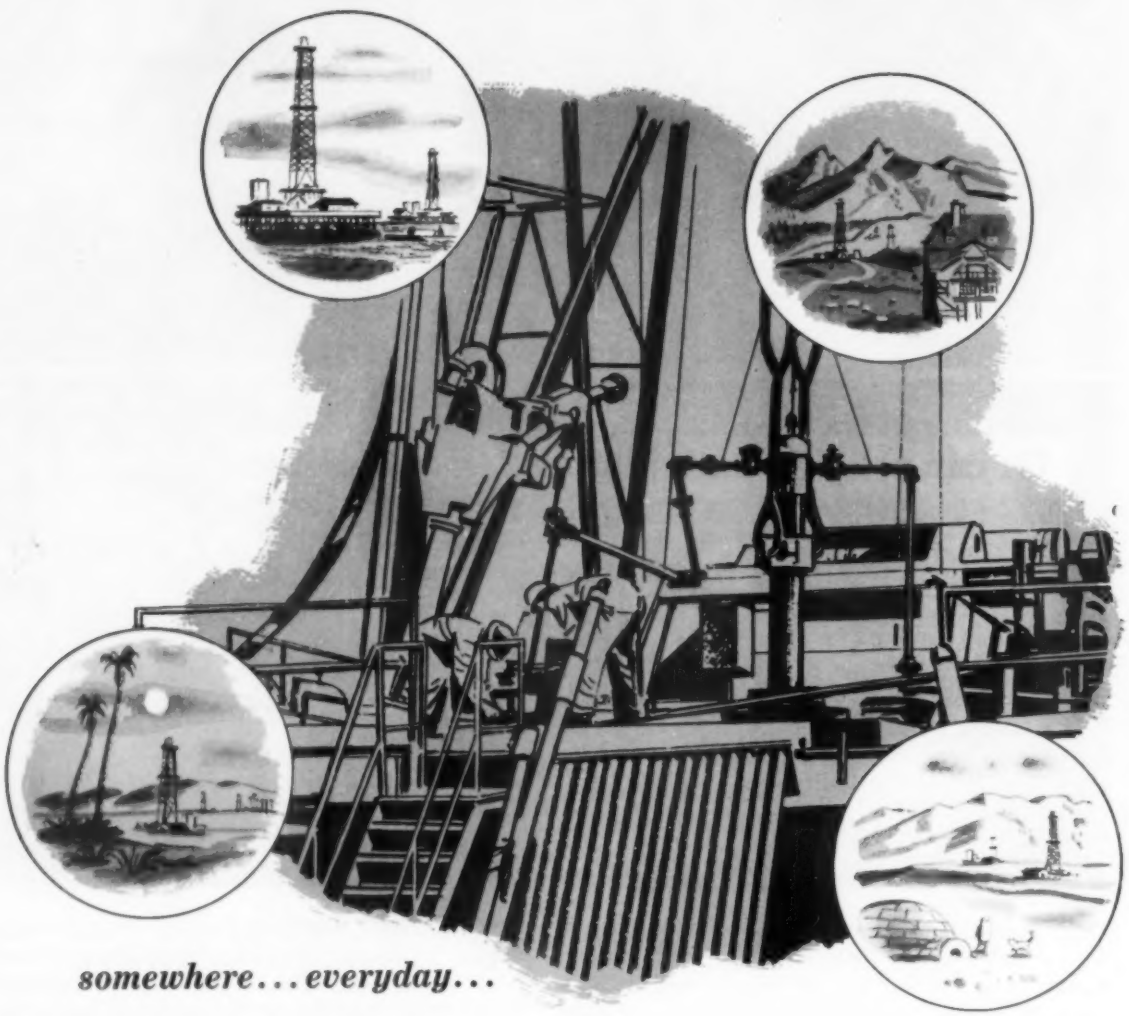

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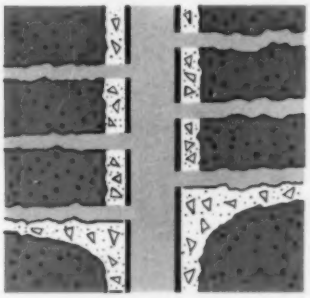
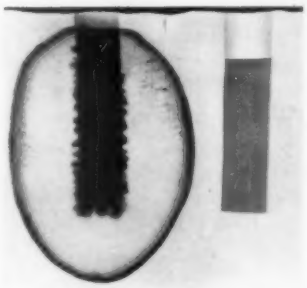
SQUEEZE CEMENTING IS MORE EFFICIENT AND EFFECTIVE WITH THESE HALLIBURTON PRODUCTS

RTTS PACKER

RTTS—HALLIBURTON RETRIEVABLE TEST-TREAT-SQUEEZE PACKER

The highly versatile tool that is a multi-purpose hook wall type retrievable packer with full opening mandrel. The advanced tool design of the packer allows easy adaptability for combination treating and squeezing applications *with only one trip into the hole.* Equipped with a circulating valve that permits tubing and annulus pressure to be equalized at packer when needed; can be locked in an open or closed position and can be opened any time to allow circulation above the packer. The unique safety joint and drillability features of this packer make it very useful in squeeze cementing.





HALLIBURTON DOC (Diesel Oil Cement)

Uses water in the formation to produce a set cement of high density, high compressive strength and very low permeability. Widely used in squeeze cementing operations to aid in shutting off water in oil wells.

Since DOC is composed only of cement, diesel oil and Halliburton's efficient dispersant DOC-2, it will never set until contacted by water. After the initial contact with water, which thickens the slurry, the unthickened DOC in the pipe is reversed out with ease. This desirable feature provides effective water shut-off with relatively small volume of this low fluid loss mixture.

RESIN-CEMENT

A blend of resins, water and portland cement with excellent "squeezing" characteristics. Successfully used for open hole bottom plugs, squeezing through perforations, setting around casing shoe or opposite water zones and other remedial work in oil and gas wells where ordinary cementing materials fail. The fluid phase that is squeezed from the Resin-Cement slurry penetrates into the formation and sets up in a firm, hard mass which gives a very effective seal that is resistant to oil, mud, corrosive waters and gases.

DM-DC DRILLABLE SQUEEZE PACKER

DM-DC DRILLABLE SQUEEZE PACKER

Halliburton DM-DC Drillable Squeeze Packers—specially designed for squeeze cementing. Dependable and easy to set on drill pipe, tubing or electric wire line—provide a positive fluid "shut-off" from either direction, regardless of depth and pressure. May become a Bridge Plug when a Sealing Plug or Ball is dropped or pumped in place after Packer is set.

CEMENTING SERVICES

284 SERVICE CENTERS—JUST MINUTES AWAY FROM YOUR WELL

NEW! COMPACT, HIGH OUTPUT WHITE SUPERIOR "SUPER" PTDS-6M

Now... wider power selection of famous Superior "PTD" engines!

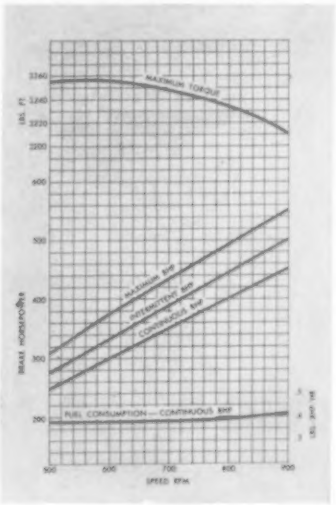
Where oil well drilling calls for a *compact* engine delivering 450 to 550 BHP, the new Superior "Super" PTDS-6M fulfills all requirements.

PTDS-6M is a rugged six-cylinder engine with a space-saving turbocharger arrangement. The model develops 450 HP continuous, 500 HP intermittent, and 550 HP maximum at 900 RPM. Yet the oil field power unit only requires 120" base length including radiator.

Like all Superior engines, it offers a two-way power bonus. First, HP ratings indicate actual, usable horsepower of standard, stock engines equipped with all accessories, including radiator and fan. No correction is necessary to 1500 ft. elevation and 90° F. This results in 7.5% more usable horsepower, because some engines require derating above sea level and 60° F. Second, the power rating of PTDS-6M is conservative, in line with Superior's traditional policy, leaving generous reserve power still available for hardest duty.

PTDS-6M rounds out a complete range of simply-designed, low-maintenance Superior diesel drilling engines, up to 935 BHP maximum. All models carry new higher ratings that reflect true, field-proved horsepower available for dependable performance in toughest oil field service. Ask for new Bulletin 118 at leading rig manufacturers, from White oil field representatives or through White Engine Division.

RATING CURVES: *Intermittent—power available for hoisting; continuous—power available for mud pump and rotary table.*



White Diesel

WHITE DIESEL ENGINE DIVISION
THE WHITE MOTOR COMPANY
Plant and General Offices: Springfield, Ohio

Superior ENGINES · ATLAS Imperial DIESEL ENGINES · White DIESEL

NOW...HIGH SPEED VALVE OPERATION... slow speed seating Advantages

The illustration shows a style HM LimiTorque with "Hi-Lo" attachment mounted on a W-K-M 16" series conduit valve for operation on a large oil pipeline. The particular Unit causes the valve to open the full 16" of travel in 12.5 seconds, and close the valve through the same distance in 2 minutes and 40 seconds.

WITH THE NEW Hi-Lo LimiTorque ATTACHMENT

LimiTorque now has available a complete new design "Hi-Lo" 2-speed attachment, which is a magnetic clutch actuated gear reduction unit. The "Hi-Lo" attachment is mounted between the motor and the LimiTorque housing, and permits operation at either of 2 "speeds", and is capable of changing speeds under load. It permits hi-speed valve operation and still retains the slow speed seating characteristics required by most valves.

The "Hi-Lo" attachment permits as high as 18:1 ratio in speeds, and is controlled either by pre-set limit switches or relays mounted in the LimiTorque Operator or by other control devices located on associated equipment furnished by us or others.

The "Hi-Lo" attachment to the LimiTorque Valve Unit makes it ideal for the special requirements of water works, oil refineries, and sewage treatment plants, etc., where normal operating conditions require low or medium speed operation, but under emergency conditions fast speed operation is a must. Line surge or hammer is reduced under emergency hi-speed operation by changing to low speed operation prior to seating. Further information available from Philadelphia Gear Corporation.

THERE IS NO SUBSTITUTE FOR —

LimiTorque®

PHILADELPHIA GEAR CORPORATION

ERIE AVE. & G STREET, PHILADELPHIA 34, PENNA.

Offices in all Principal Cities

INDUSTRIAL GEARS & SPEED REDUCERS • LIMITORQUE VALVE CONTROLS • FLUID AGITATORS • FLEXIBLE COUPLINGS

Limitorque Corporation • Philadelphia

Photo taken at Delaware Refinery, Tidewater Oil Company

They keep the big cats roaring

The healthy roar of production from the big cat crackers is the measure of progress in refining and chemical technology. Teamwork between refiners and Cyanamid chemists helped to bring the development of one of the first synthetic fluid cracking catalysts and the first fully regenerative platinum reforming catalyst. Behind Cyanamid's service as a major catalyst producer are its unlimited resources as a major chemical producer.

Only Cyanamid's man with the golden rule can bring such vast chemical research and development facilities to the service of further refining progress.

Basic in Catalyst Chemistry

CYANAMID

AMERICAN CYANAMID COMPANY • REFINERY CHEMICALS DEPARTMENT • 30 Rockefeller Plaza, New York 20, N. Y.

Originators of AEROCAT® Fluid Cracking Catalysts, AEROCAT TRIPLE A® High Alumina Catalysts, AEROFORM® Fluid Hydroforming and Platinum Reforming Catalysts, AERO® HDS Catalysts, AERO® Specialty Catalysts, CYPAN® Drilling Mud Conditioner, AEROLUBE® Lubricating Oil Additives, AERONOX® Antioxidants, AEROSOL® Surface Active Agents.

"SPECIAL" Welding Fittings

by MIDWEST

"SPECIAL" DESIGNS

"SPECIAL" MATERIALS

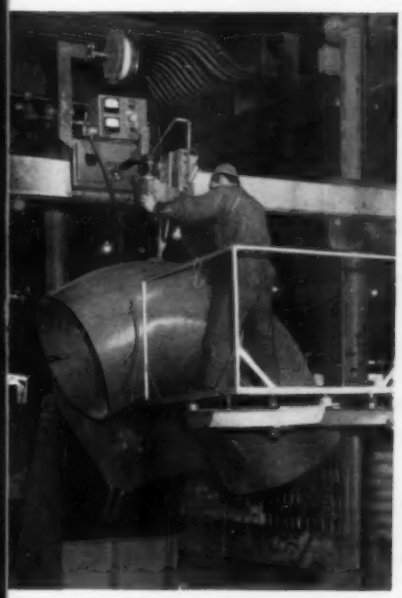
"SPECIAL" QUALITY

"SPECIAL" DELIVERY

Special gauges and instruments are used to make sure that we have complied with the extremely close tolerances often required on stainless fittings. Here wall thickness and concentricity were held within extremely close limits throughout the fittings.

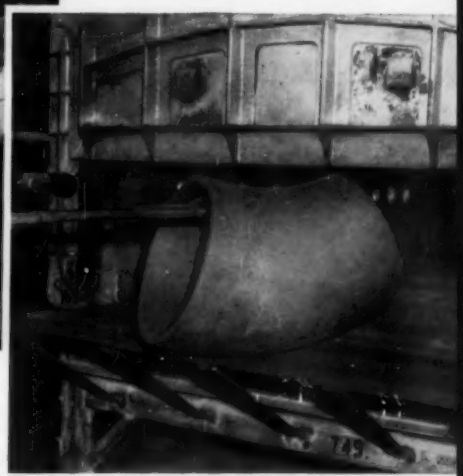
The exclusive Midwest method of manufacture—much more versatile and flexible than any other—enables us to make almost any type of special welding fittings to the most rigid specifications. Midwest makes welding fittings from *plate* . . . usually much easier to get than pipe, particularly if the material is special. That expedites delivery. Closer tolerances are inherent in the Midwest process, and quality control is always beyond code requirements.

Even if you use only standard fittings, the exceptional quality of Midwest fittings can be important to you. Ask your Midwest distributor or write us for new Bulletin 5801.



36" O.D. 90° elbow with 16" tangent on one end being welded by an automatic submerged arc machine. Material is A-201 carbon steel.

Stainless-clad elbows undergoing ultrasonic inspection to check bonding of material and quality of weld. Since plate is often the only form in which clad material is available, the Midwest process is able to produce the most comprehensive range of clad fittings—and to do so promptly.



Special 24" x 21" 45° reducing elbow made of 1" thick 1¼% chrome ½% moly steel ready for heat treating furnace.

MIDWEST
PIPING COMPANY, INC.

Main Office: St. Louis 3, Mo. (P.O. Box 433)

PLANTS: ST. LOUIS, CLIFTON, N. J. and LOS ANGELES

SALES OFFICES:

Asheville (Box 446, Skyland, N. C.) • Atlanta 9—71 11th N.E. • Boston 27—426 First St. • Chicago 3—79 West Monroe St. • Cleveland 14—616 St. Clair • Houston 2—1213 Capitol • Los Angeles 33—520 Anderson • Miami 34—2103 La Jeune • New York 7—50 Church St. • Pittsburgh 19, Pa.—437 Grant • San Francisco 11—420 Market St. • St. Louis 4, Mo.—1450 South Second St. • Tulsa—1640 E. 21st St.

STOCKING DISTRIBUTORS IN PRINCIPAL CITIES

3059

There is a difference in sucker rods

JONES

alloy

SUCKER RODS

TYPE 12

For added strength to lift heavier loads with no increase in rod size.

Made from strong, corrosion resistant nickel chromium molybdenum processed electric furnace steel, fully normalized and drawn; has exceptionally high yield strength and excellent fatigue resistance.

SPECIFY—Jones Sucker Rods for deep wells and all wells . . . for proved longer life.

The S. M. Jones Company modern manufacturing plant, Toledo, Ohio

THE S. M. JONES COMPANY

●

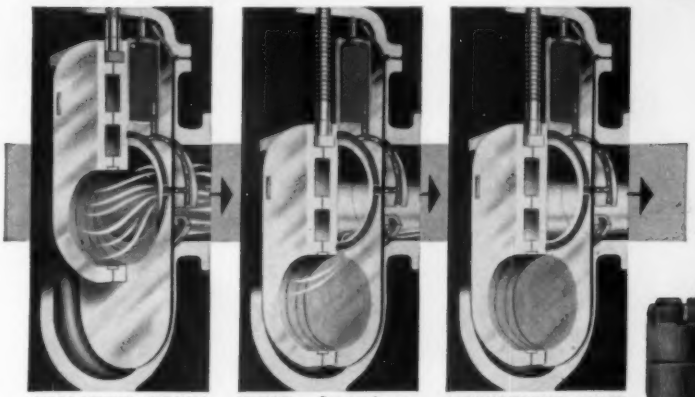
Division of Buffalo-Eclipse Corporation

General Office and Factory:
TOLEDO, OHIO
Sales Office: Enterprise Building,
TULSA, OKLAHOMA
Export Sales Representatives:
IDECO, One of the Dresser Industries,
Republic National Bank Building,
Dallas, Texas, and
Chanin Building, New York City

6674

For pipeliners who hate leaks!

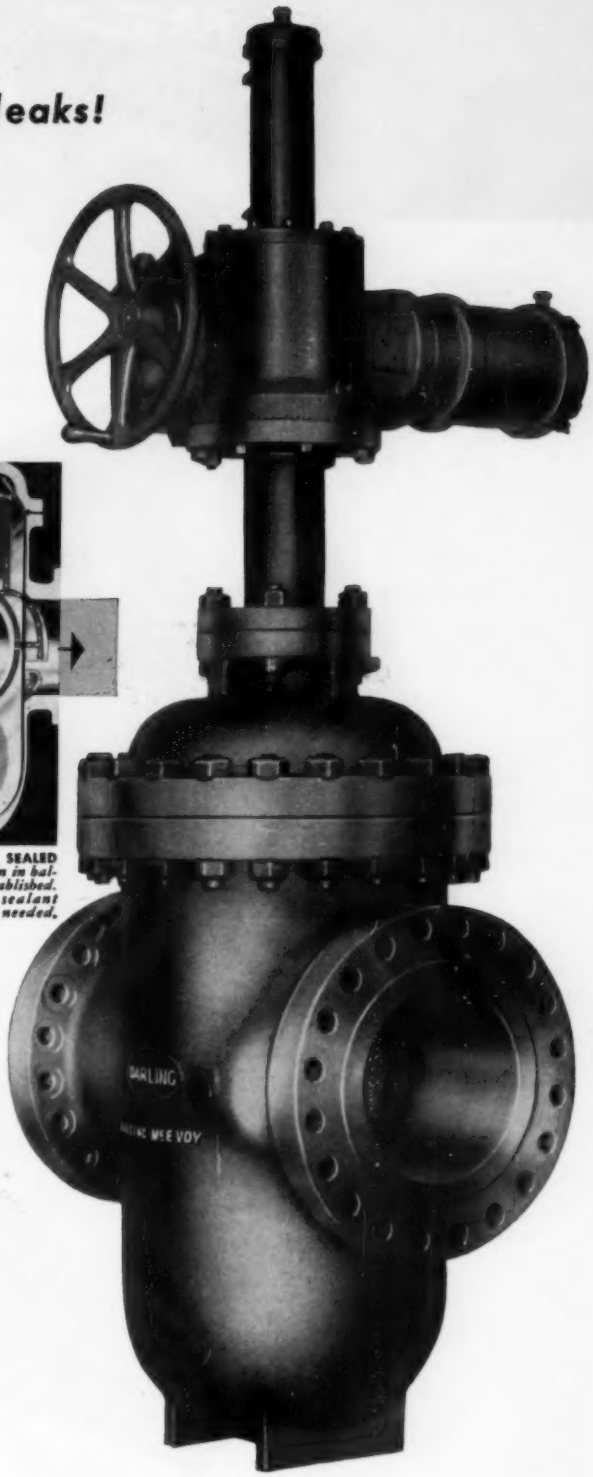
DARLING-McEVOY SELF-SEALING CONDUIT VALVES



APPROACHING CLOSURE *... No loss of sealant as sealing groove in seat is disconnected from reservoir until gate is fully closed.*

CLOSED *... Jumper in gate now permits differential pressure to feed sealant into seat groove to check any remaining flow.*

AUTOMATICALLY SEALED *... Pressures again in balance. Tightness established. No additional sealant used until again needed.*



THE DIAGRAMS above show how these unique conduit gate valves seal themselves *automatically* . . . by means of a long lasting reservoir-held sealing compound . . . for leak-proof, pressure-tight closure every time! This feature, with flow in either direction, self-aligning non-wedging gates, and fully protected non-distorting seats, means exceptional performance, utility and service life. For additional information on these fully field-proved Darling-McEvoy valves, ask for Bulletin 5402.

DARLING VALVES

DARLING VALVE & MANUFACTURING CO.

Williamsport 1, Pa.

Manufactured in Canada by Sandilands Valve Manufacturing Company, Ltd., Galt 19, Ontario

HOW BIT

In a West Texas Well, Magcobar Engineers put a film here.....

Another Well Done *with*

LUBE AND MAGCOBAR ENGINEERING CUT DRILLING COSTS

You are always sure of getting every cost-cutting advantage with Magcobar. Here's why: The Magcobar Mud Engineer combines a thorough knowledge of drilling fluid chemistry with experience in your drilling area. This background—plus the top mud lab in the country—gives new dimension to the finest and most complete line of drilling mud products. What does this mean to you? The highest level of product performance to cut your drilling costs.

..... to make net savings of $4.87 per foot

Here's proof of actual savings using Bit Lube (E. P. Additive for Mud). The table below shows a drilling cost comparison in the Brownfield, Texas, area. The Bit Lube well was drilled for $4.87 per foot less than the offset well.

	NO. BITS	BIT SIZE	INTERVAL	ROTATING HOURS	WEIGHT ON BIT	RPM
BIT LUBE-WATER	28	7⅞"	4919-7272	185	70-90,000	60-80
WATER	40	7⅞"	4936-7270	379	45-60,000	55-60

Total savings in bits, trips, and drilling time was $13,420. Bit Lube and emulsifiers cost $1,940; a net saving of $11,480!

Bit Lube forms a tough protective film to reduce friction and to increase bit bearing life under extreme pressure conditions. It works best with high weight on the bit and fast rotary speed. Bit Lube and Magcobar engineering may be the answer to your bearing failures.

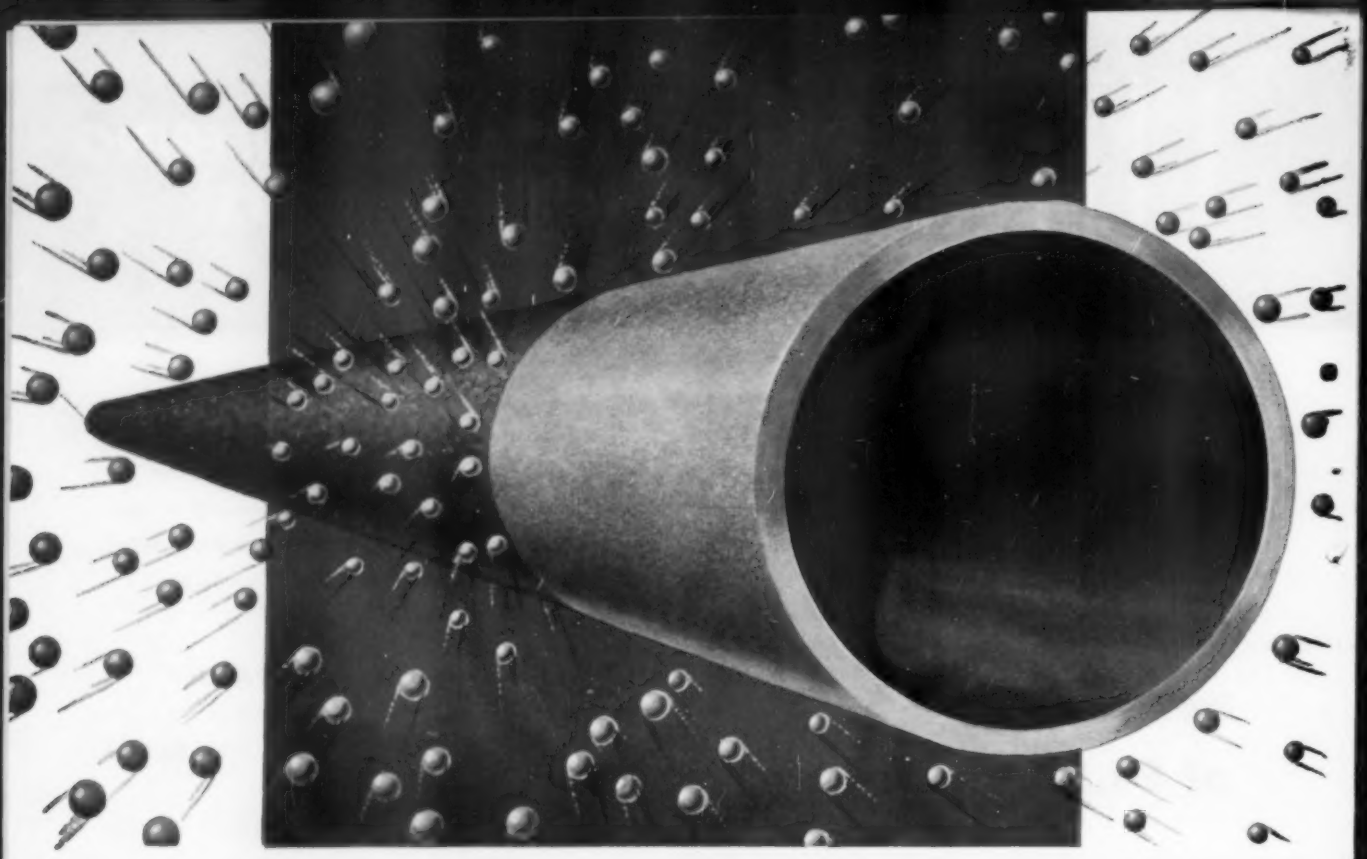
Bit Lube is only one of Magcobar's many answers to the problem of high drilling cost, a problem that demands the right answers. You'll find that the right products *used right* by Magcobar can cut costs on your next well, too.

Magcobar
Complete
DRILLING MUD SERVICE

MAGNET COVE BARIUM CORPORATION
HOUSTON, TEXAS

59 209

Magcobar Technology!



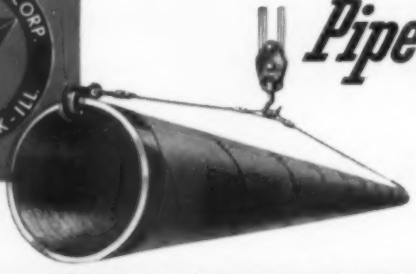
Steel Shot Cleaning makes Pipe Protection Stay Put

Applying protective coatings to improperly prepared pipe surface makes about as much sense as building a skyscraper on sand. Pipe Line Service has always pioneered in developing new ways to insure a good bond . . . a bond that makes protective coatings practically inseparable from the pipe itself.

An outstanding example is steel shot cleaning. Special machines permit bombardment of the pipe surface with millions of steel pellets traveling at high speed. Result? Not simply removal of mill scale and rust . . . but actually an "etching" of the steel surface. This slightly roughened surface allows the protective coating to "take root"—gives you the years of protection that you should have.

We emphasize Pipe Line's steel shot cleaning process because it was one of the great steps forward in maximum protection of *your* pipe investment. It's a manufacturing extra that's provided at no extra cost . . . and one more reason for extra confidence in specifying protection by PLS!

PIPE LINE SERVICE CORP. SERVICE EQUIPMENT MATERIALS FRANKLIN PARK - ILL.



Pipe Line Service Corporation

General Offices and Plant: Franklin Park, Ill.

Quality pioneers in coating and wrapping pipe for over a quarter century

A SUBSIDIARY OF AMERICAN STEEL FOUNDRIES

Plants also at: Monmouth Junction, N. J.; Glenwillard, Pa.; Sparrows Point, Md.; Longview, Tex.; Corpus Christi, Tex.; Provo, Utah; Harvey, La.

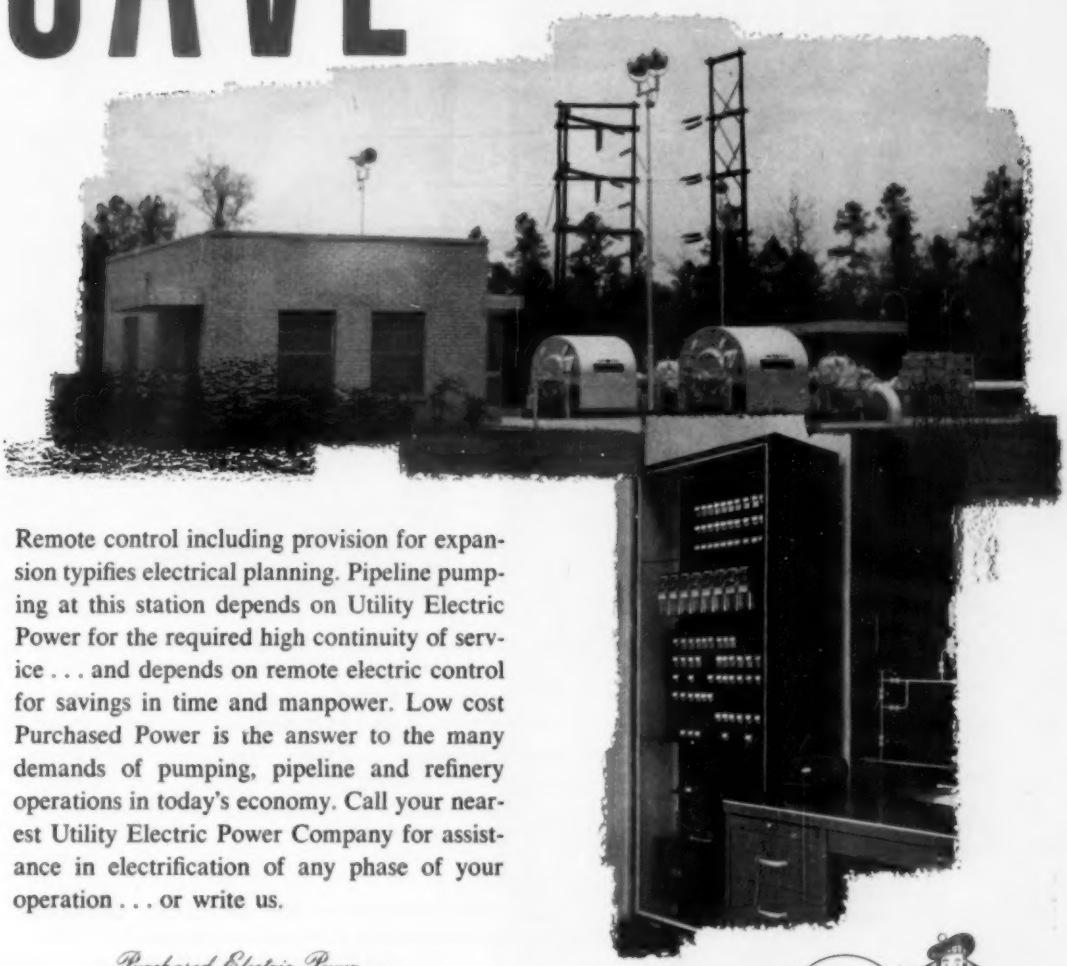
Sales offices at all plant locations . . . and Atlanta, Ga.; Houston, Tex.; Lincoln, Nebr.; Tulsa, Okla.

SAVE manpower

SAVE money

SAVE maintenance

SAVE with Electrified Pipelines



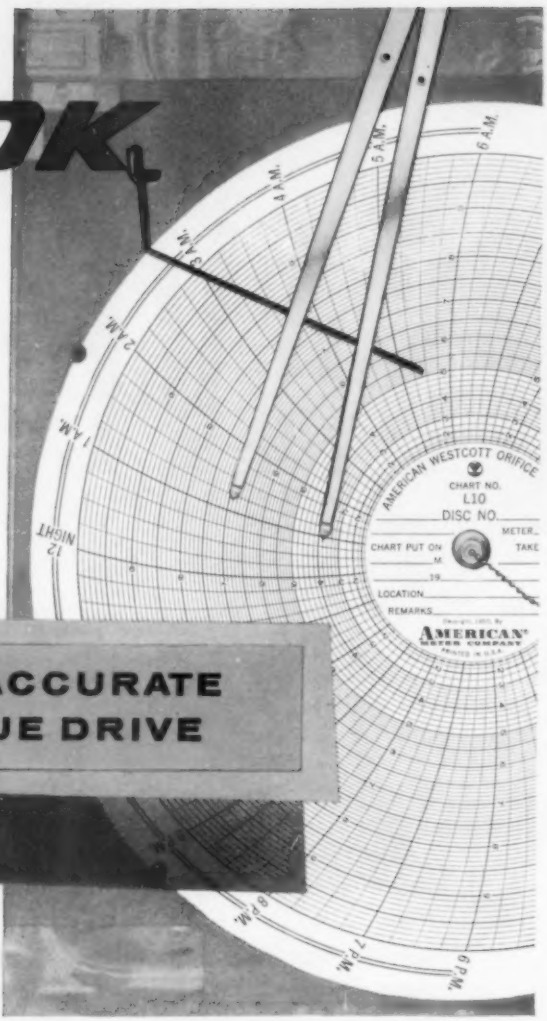
Remote control including provision for expansion typifies electrical planning. Pipeline pumping at this station depends on Utility Electric Power for the required high continuity of service . . . and depends on remote electric control for savings in time and manpower. Low cost Purchased Power is the answer to the many demands of pumping, pipeline and refinery operations in today's economy. Call your nearest Utility Electric Power Company for assistance in electrification of any phase of your operation . . . or write us.

Purchased Electric Power . . .
saves money, manpower, maintenance
and serves you better automatically

Petroleum Electric Power Association

P.O. BOX 35006, DALLAS 35, TEXAS

AMERICAN®
GASCLOK
POWER DRIVE



Check these features--

- **Completely self-contained gas or air-powered instrument driving and timing unit for long, trouble-free operation in remote locations.**
- **Constant high power...more than 20 times the torque delivered by conventional spring-wound mechanisms.**
- **Timing accuracy continuous...no heavy "mainspring" to weaken or run down...unaffected by a ± 20% variation in supply pressure.**
- **Self-starting...no winding or priming of power unit.**

VERSATILE • ACCURATE
HIGH TORQUE DRIVE

- **Flexibility...ideal as original or replacement equipment for strip chart and conventional circular chart instruments.**
- **Built-in durability...timing mechanism internally sealed to prevent corrosion...large area internal ports prevent clogging.**
- **Rugged dependability...all power unit parts exposed to gas are aluminum or stainless steel...inherently explosion proof.**
- **Economical...normal air or gas consumption 5 cfh...operating pressure 5 psi...rotation 2 rpm.**

Then ask
your American representative how the versatile ***GASCLOK*** can provide new metering accuracies and economies for you.

AMERICAN METER CO

AMERICAN®
METER COMPANY
INCORPORATED (ESTABLISHED 1836)

GENERAL SALES OFFICE: Philadelphia 16, Penna. • Albany • Alhambra • Atlanta Baltimore • Birmingham • Boston • Chicago • Dallas • Denver • Erie • Houston Kansas City • Los Angeles • Minneapolis • New York • Omaha • Pittsburgh • San Francisco • Seattle • Tulsa • Wynnewood • IN CANADA: Canadian Meter Company, Ltd., Milton, Ontario • Calgary • Edmonton • Regina

SUPPLIERS TO THE GAS INDUSTRY for Ironcase, Tinned Steelcase, Aluminumcase and Welded Steelcase Meters • American-Westcott Orifice Meters • Instruments • Reliance Regulators • Apparatus • Valves

The WECO

AIR-O-UNION*

PAT. PEND.

SEALS WITH A SHOT OF AIR

For Mud Suction and Return Lines

For Low Pressure Fluid Lines

AIR-O-UNIONS, now manufactured by WECO, are available from WECO and Chiksan representatives and supply stores throughout the world.

These air sealed unions give you a perfect seal on low pressure lines . . . make up fast and easy without close line-up . . . allow pipe expansion and mis-alignment without breaking the seal. No bolts, nuts, wrenches required . . . just jab the pipe through the union, inflate the tube and they're made up ready for service. To break out just deflate the tube.

For efficient, low cost mud suction, mud return and other low pressure lines, install WECO AIR-O-UNIONS. Ask your WECO Representative or your supply store.

*(FORMERLY MADE BY AIRO MFG. CO.)

AIR-O-U
only two
tube and
manently
replaceme
the tube.
to 16".

Switch
saving, s
for all lo

WECO

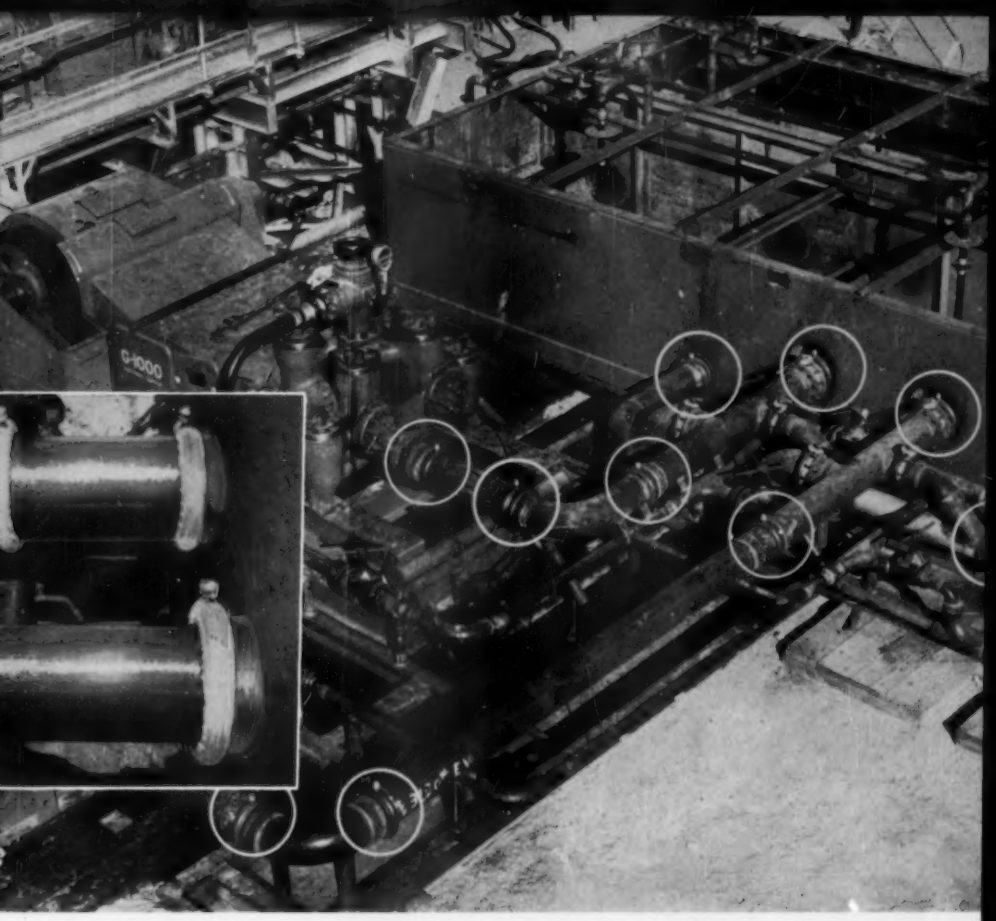
WELL EQUIPMENT MFG. CORP.

HOUSTON, TEXAS

Division of CHIKSAN COMPANY a subsidiary of
FOOD MACHINERY AND CHEMICAL CORPORATION

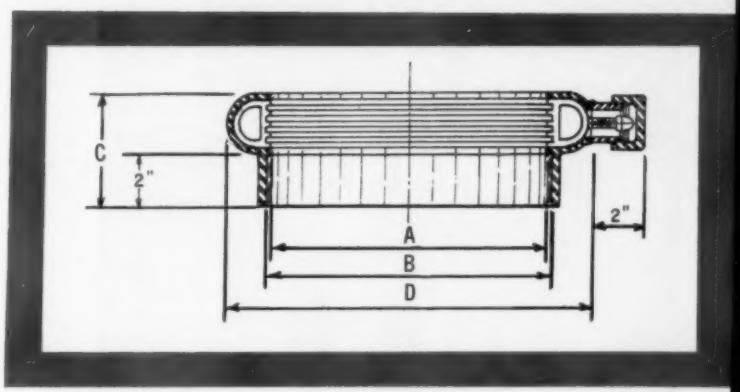
fmc

Distributed in California by Chiksan Co., Brea, Calif.; in Canada by Chiksan of Canada, Ltd., Edmonton, Alberta; and other foreign countries by Chiksan Export Company, Brea, Calif.



AIR-O-UNIONS on mud tanks and suction lines save hours of rig-up time. All you do is slip the pipe in place, inflate the tube and your suction lines are ready for service. (Inset Above) Installation of Air-O-Unions for compounding mud tanks.

O-UNIONS consisting of
wo parts, the inflatable
nd union body, are per-
tly welded in place. Only
ement ever required is
be. Sizes range from 6"
".
ch to low-cost, time
, simplified Air-O-Unions
low pressure lines.



SIZE	DIMENSIONS				WEIGHT LBS.
	A	B	C	D	
6"	6¾"	8¼"	4"	10¼"	14
8"	8¾"	10¼"	4"	12⅜"	19
10"	10⅞"	12"	4¼"	14½"	23
12"	12⅞"	14"	4¼"	16½"	31
13"	13⅝"	14⅝"	4¼"	17¼"	34
16"	16¼"	16½"	4¼"	20"	24 (alloy)

Presenting

3

NEW MEMBERS

OF THE

WECO®

FAMILY OF FINE PRODUCTS

The WECO
CLEANOU

(Formerly All

The rectangular Cleanout Gate ca
outside of wood or metal, round or re

The frame is bolted or welded t
Neoprene gasket. A synthetic rubber
seals the gate and frame opening. A
forces the gate into sealed position wi
of the handle holds the gate in open
is provided with link jars to free the
of being closed.

The WECO Cleanout Gate cannot be
tight. Quick and inexpensively installe
a large rectangular opening for quick
operations.

Cleanout Gates are available in two sizes: Type L. (Large) 115 sq. in. opening. Type S. (Small) 49 sq. in. opening.

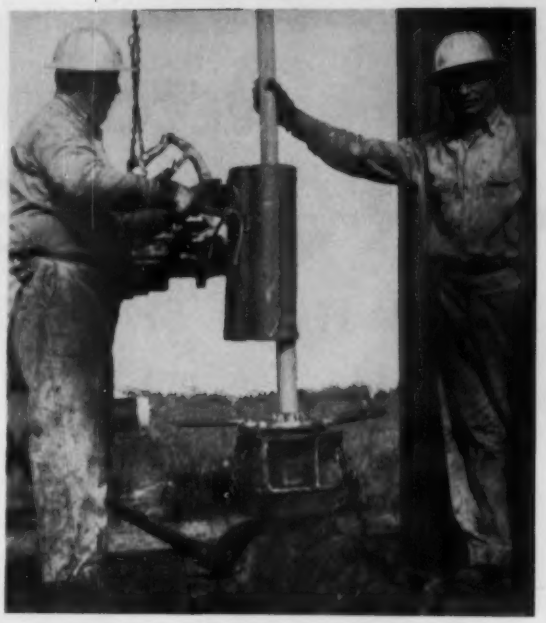
Distributed in C
ton, Alberta; an

O
UT GATE

y AIR-O)

can be installed on the inside or
r rectangular tanks or vats.
d to the tank and sealed with a
ber ring, vulcanized to the frame
. A cam on the operating handle
n when closed. A lug near the top
pen position. The operating handle
he gate if stuck after long periods

t be fouled and is completely fluid
alled, the Cleanout Gate provides
ick dumping and easy washing out



WECO TUBING WET BOX

Keep the work area cleaner and safer when pulling tubing by using the WECO Tubing Wet Box. Light weight and easy to handle the Wet Box clamps around the tubing joint, preventing fluid from spraying over the work area and endangering the safety of the crew. Due to its light weight (14 pounds) it can be easily handled manually, without suspension. The box is fully opened and tightly closed by a single operating handle.

One size box can be used for all sizes of tubing by changing the synthetic rubber seal in top of the box. Always use a WECO Tubing Wet Box when pulling tubing. Available from your supply store or ask your WECO representative. Specify tubing size when ordering.

Tubing Wet Box in closed position

Tubing Wet Box in open position

WECO

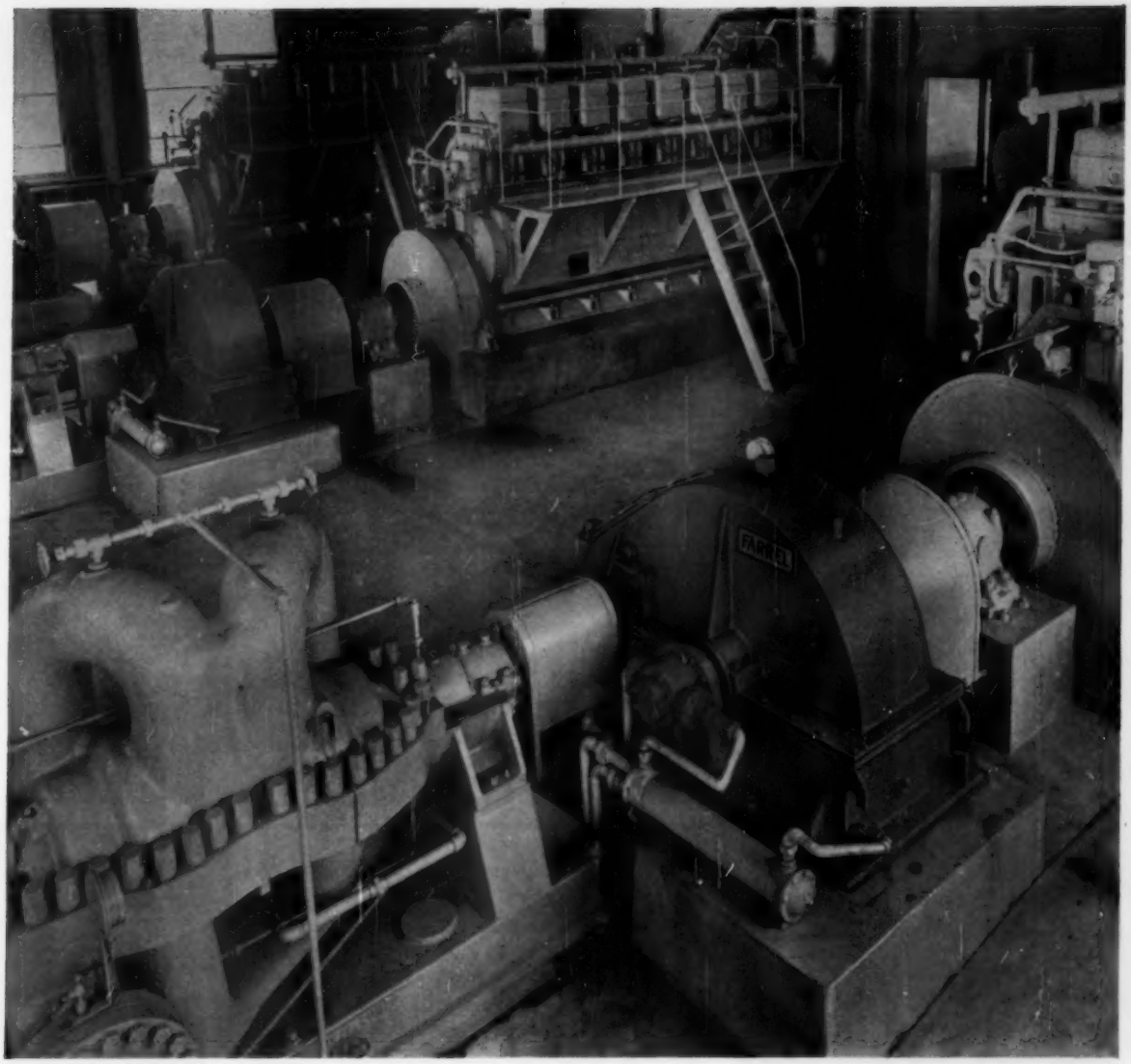
WELL EQUIPMENT MFG. CORP.
HOUSTON, TEXAS

Division of CHIKSAN COMPANY a subsidiary of
FOOD MACHINERY AND CHEMICAL CORPORATION

fmc

AO-1-59

n California by Chiksan Co., Brea, Calif.; in Canada by Chiksan of Canada, Ltd., Edmon-
and other foreign countries by Chiksan Export Company, Brea, Calif.



SPEED INCREASERS UNATTENDED

at two full-satellite pipeline pumping stations

Two of the four pumping stations on Evangeline Products System's 16-inch pipeline from Port Arthur, Texas, to Baton Rouge, Louisiana, are each powered by three Nordberg 1700 HP Duafuel engines. These are full-satellite stations, and are attended only during daylight hours. All functions are controlled from the master station at Port Arthur.

The engines drive centrifugal pumps through Farrel gear units, which step up the speed from 500 to 2402 RPM. Farrel gear units have a pipeline history that makes them an ideal choice for a remotely controlled or unattended pumping station. Of the thousands of units installed, since they were first developed in 1932, *not one has ever been known to be replaced.* Even the first units built are still in service.

Send for full details of these long-lasting, trouble-free units. Ask for a copy of Bulletin 451.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N. Y.
Sales Offices: Ansonia, Buffalo, Boston, Akron, Ann Arbor (Mich.), Chicago, Minneapolis, Los Angeles, Salt Lake City, Tulsa, Houston, Fayetteville (N. C.).
European Office: Piazza della Republica 32, Milano, Italy

FB-1152

Farrel-Birmingham®

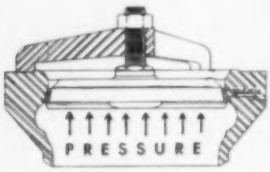
It's no effort at all to reach the internals of this Peerless Gas Odorizer through the Sillers Flex-Ring Closure.

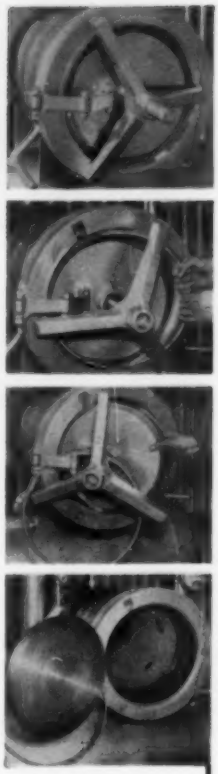
Sillers Flex Ring Closures are utilized on these large scrubbers at a Field Processing Plant in South Texas.

Here is a typical Sillers Flex Ring Closure installation on a Sillers Scraper trap on a products pipeline in Eastern Oklahoma.

SILLERS FLEX RING CLOSURE

for faster access to the inside of pressure vessels or piping . . .





(1). Flex Ring Unit assembled as in service. (2). Spider released, gasket being removed. (3). After gasket is removed, plug is rotated to open. (4). Unit completely opened and in a fraction of time taken for conventional type closures.

SIMPLE and SAFE to OPERATE...

An entirely new design and seal principle, the SILLERS FLEX RING CLOSURE gives you many advantages and economies such as LOW INITIAL COST . . . LESS TIME IN OPENING AND CLOSING (JUST ONE BOLT) . . . TIGHTER SEAL AT HIGH PRESSURES . . . LESS WEIGHT . . . EASE OF HANDLING . . . and NO SEAL DESTRUCTION IN CASE OF FIRE. Sillers Flex Ring Closures are available in all standard sizes and can quickly be adapted for special applications.

GET COMPLETE DETAILS TODAY
SEND FOR BULLETIN NO. 3000

The perfect closure for Boilers, Evaportors, Heat Exchangers, Autoclaves, Filters, Strainers, Absorbers and all types of Pressure Vessels and Piping Systems.

FOR USE ON

BOILERS
EVAPORATORS
HEAT EXCHANGERS
FILTERS
STRAINERS
ABSORBERS
PRESSURE VESSELS

SILLERS ENGINEERING COMPANY

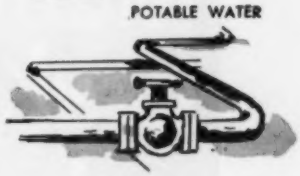
Division of Peerless Manufacturing Company

BOX 13165 DALLAS, TEXAS

Representatives in Principal Cities

REMARKABLE *new* RIGID PLASTIC PIPE!

★ Higher Tensile Strength
★ Higher Heat Resistance



MADE OF CYCOLAC® C ABS
ABS TYPE II
Thermoplastic Resin
(NSF APPROVED)

New Thermoplastic Resin from BORG-WARNER

Now there are two types of ABS rigid plastic pipe made of Cycolac, the *tough* thermoplastic. The original Borg-Warner Cycolac L ABS Type I resin has already proved its worth in scores of applications from coast to coast.

The new Cycolac C ABS Type II resin offers increased tensile strength, greater heat resistance and other important advantages over metal. Among these are light weight, ease of installation and protection against corrosion.

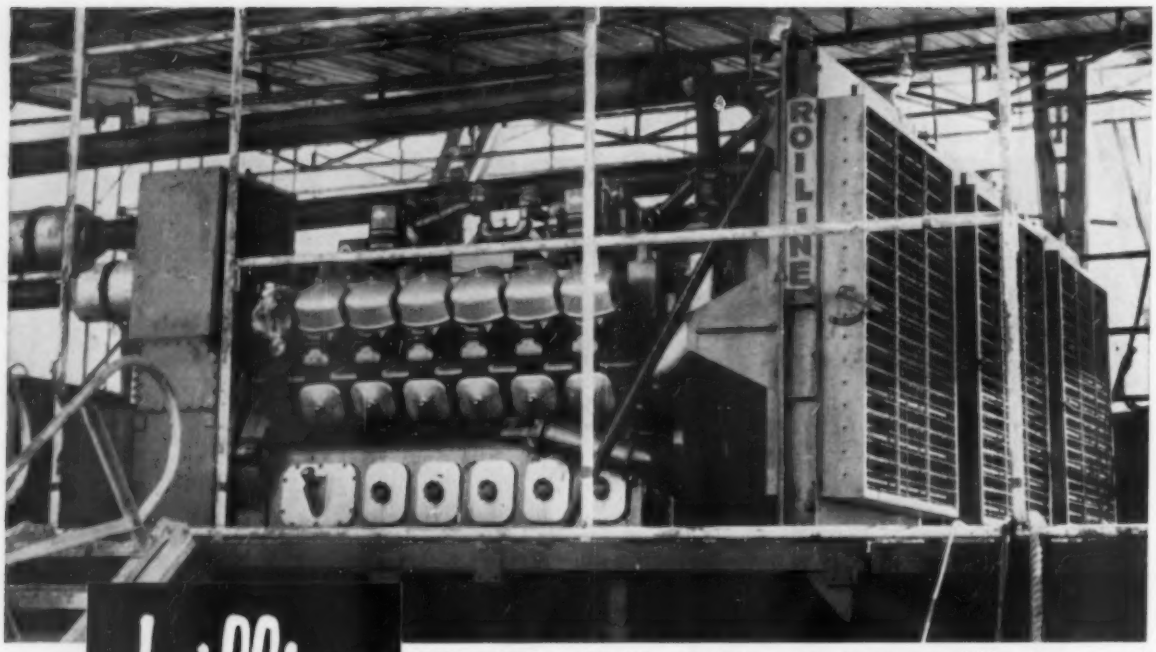
To users of pipe, Cyclolac C offers superior service over a greater range of temperatures with increased chemical resistance.

WRITE FOR NAME OF YOUR NEAREST CYCOLAC EXTRUDER

PACESETTER IN
Marbon CHEMICAL
SYNTHETIC RESINS

DIVISION of BORG-WARNER
WASHINGTON, W. VA. • GARY, INDIANA
also represented by:
WEST COAST: Harwick Standard Chemical Co., Los Angeles, Cal.
CANADA: Dillons Chemical Co. Ltd., Montreal & Toronto
EXPORT: British Anchor Chemical Corp., New York

BW ® Marbon



Falcon Seaboard Drilling Co. rig, in Grady County, Okla., is powered with three ROILINE Engines—Model L-3460—12-cylinder V-type, 7¼-in. bore x 7-in. stroke, 3468 cu. in. displ., counterbalanced crankshaft, operating on natural gas, up to 586 hp at 1350 rpm.

drilling speed and capacity with three ROILINE ENGINES

(formerly LE ROI)

• Deep drilling power . . . lots of it . . . and fast acceleration that saves time and speeds up drilling!

Because of their V-12 cylinder design, light pistons, short radius rotating parts, and sensitive controls these Model L-3460 ROILINE Engines pick up a load fast.

Hydraulic "Zero lash" valve lifters eliminate tappet noise and adjustments and extend valve life. That means smooth, quiet engine operation and easier maintenance.

Exhaust manifold is water-cooled and integrally cast into the crankcase to provide cooler operating area and fast engine warm-up.

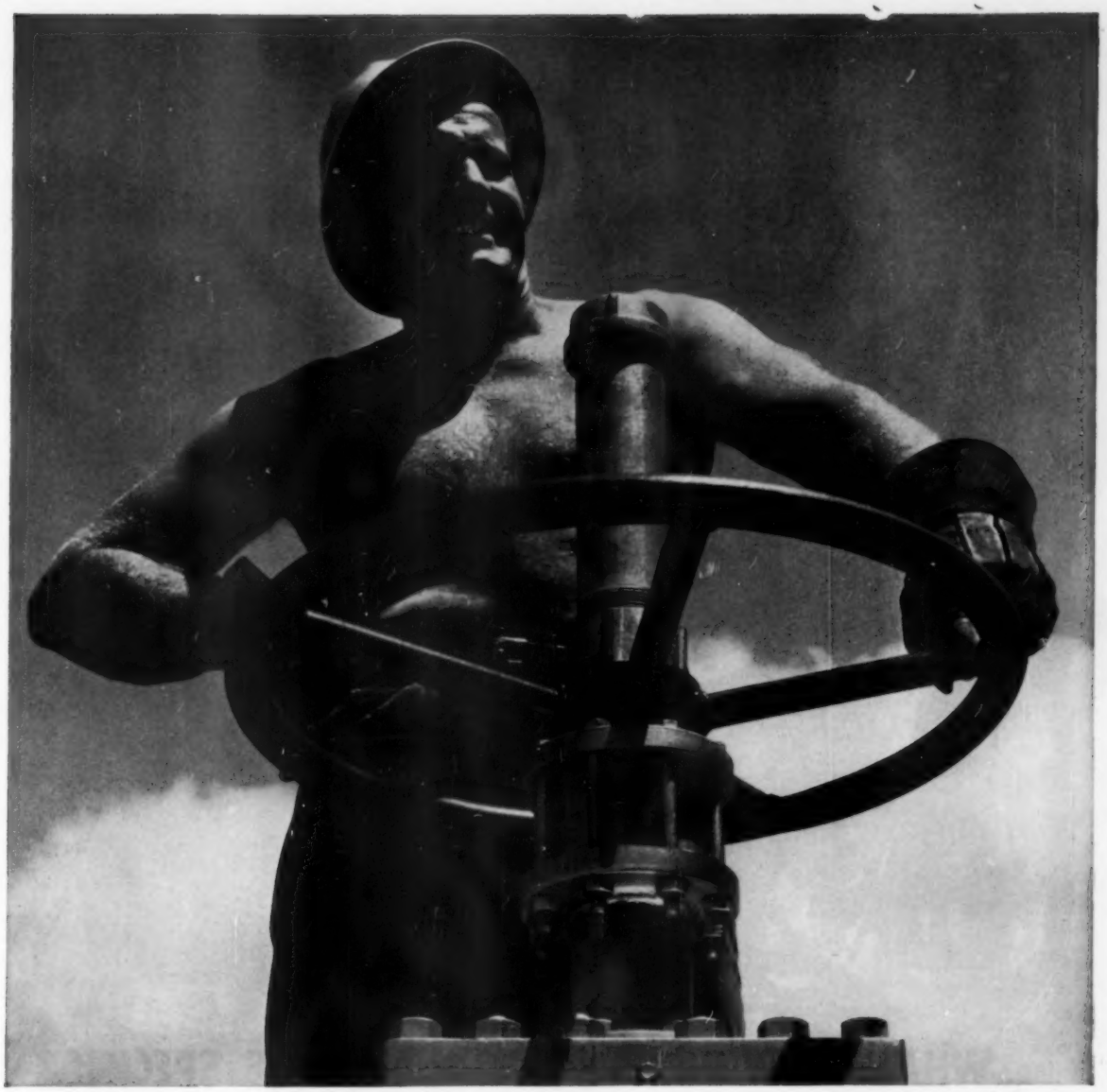
"Easy Flow" manifold design provides perfect fuel and air distribution to all cylinders through large individual intake ports. This advanced design manifolding . . . low friction bearings . . . low power loss to accessories—all contribute to ROILINES' remarkable economy of operation.

Send for descriptive Bulletin E-7.

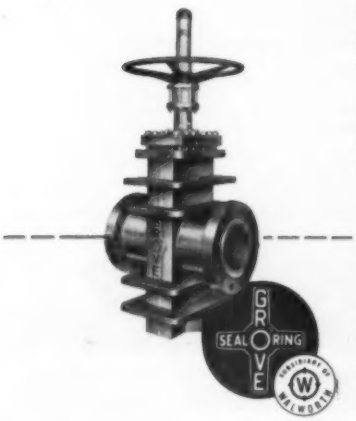
ARIZONA, Casa Grande, Engine Service Company
ARKANSAS, Paragould, Wonder State Manufacturing Co.
CALIFORNIA, Long Beach, Engine & Equipment Company
ILLINOIS, Centralia, John Nickell Company
KANSAS, Garden City, Carson Machine & Supply Co.
LOUISIANA, Shreveport, Ingersoll Corporation
MICHIGAN, Reed City, Hafer Engine Company
OHIO, Columbus 19, Cantwell Machinery Company
OKLAHOMA, Chickasha, Chickasha Gin & Mill Supplies
Oklahoma City 9, Carson Machine & Supply Co.
PENNSYLVANIA, Pittsburgh 34, P. C. McKenzie Company
TEXAS, Houston 1, Southern Engine & Pump Co.
Lubbock, Farmers Supply Company
Odessa, General Machine & Parts Co.
Wichita Falls, Nortex Engine & Equipment Co.
WYOMING, Casper, Emrick & Hill Engine & Equipt. Co.

• The trade mark LE ROI is used under license from Westinghouse Airbrake Co., the trade mark owner. 402

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN / **New York • Tulsa • Los Angeles**
Factories at: Waukesha, Wisconsin and Clinton, Iowa



You're never stuck with a GROVE VALVE



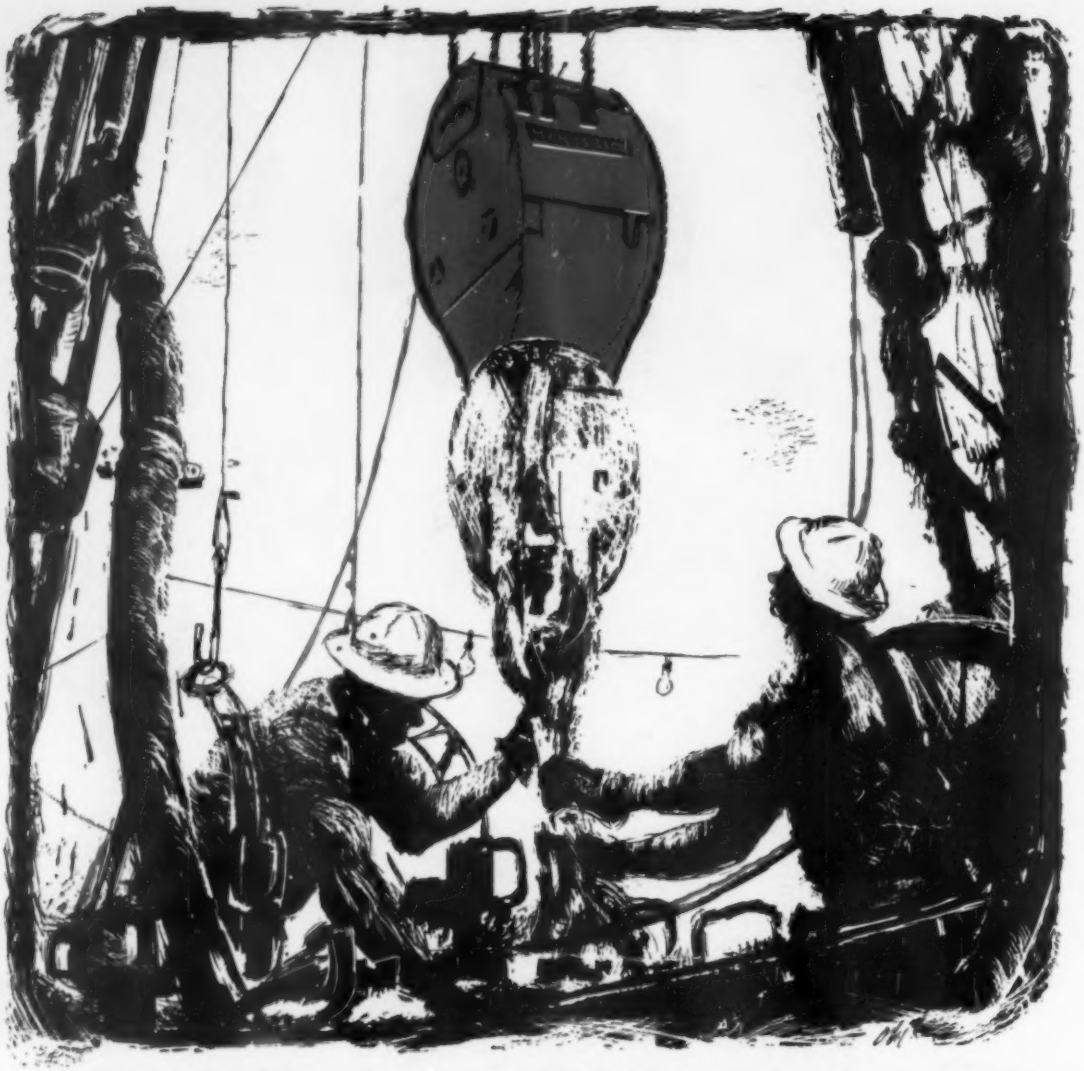
Here's the valve you set and forget. Grove's exclusive Seal-O-Rings wipe out the need for valve lubrication. You're never stuck with valve failure because of forgotten lubricant or depleted sealing compound. The load of lubrication is gone forever. Specify Grove Seal-O-Ring Gate Valves. Under pressure the tightest seal in the line.

Grove valves never require lubrication

GROVE VALVE & REGULATOR COMPANY

6529 Hollis Street, OAKLAND 8, California

HOUSTON 23—3517 Polk Avenue • LOS ANGELES 6—2559 W. Olympic Blvd.
ODESSA • TULSA • DENVER • CHICAGO • NEW YORK
FARMINGTON, N. M. • LAFAYETTE, LA. • HARVEY, LA. • In Western Canada: GROVE VALVE LTD. EDMONTON



WHATEVER YOUR REQUIREMENTS—BE SPECIFIC

GET McKISSICK

THE BEST BLOCK FOR YOUR PURPOSE

- Double row pre-adjusted Timken bearings.
- Alloy steel flame hardened sheaves, grooved to proper line size.
- Extra weight for free non-wobbling falls.
- Heavy center or divider plates between each sheave, more evenly distribute heaviest loadings, and eliminate center pin deflection.
- Johns-Manville "Klipper" grease seals positively retain lubricant, exclude all foreign matter from bearing cavity.
- E-Z* opening guards for quick stringing up—no bolts to pull out and lose.

McKISSICK

McKISSICK PRODUCTS CORPORATION
Box 2496 Tulsa, Oklahoma

GREATEST NAMES in GAS ENGINES — Carburetion by ENSIGN

This most impressive group of engine builders make up the Ensign orbit of ORIGINAL EQUIPMENT MANUFACTURERS using our products as standard factory equipment on natural gas engines. We are indeed proud of and grateful for the privilege of serving these outstanding leaders for many years. These engines operating 'round the clock year in and year out in nearly every country of the world and in the hands of the most inexperienced, provide DEPENDABLE power for petroleum, agricultural and industrial uses. The outstanding DEPENDABILITY of the gas engine, which we are proud to share, is a tribute to the engine designer who through many decades has developed to a high degree of proficiency both engine and carburetor techniques.

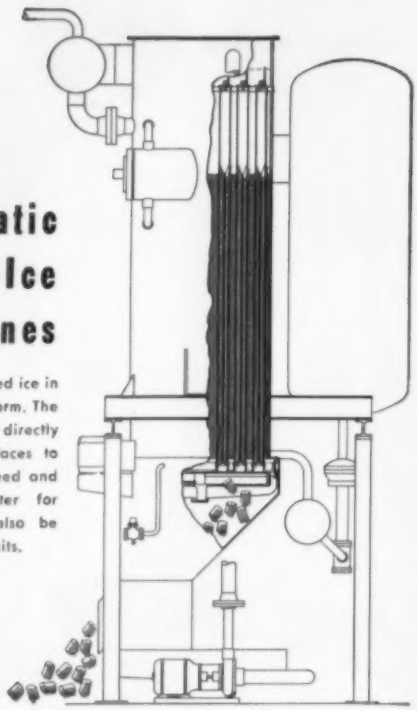
ENSIGN CARBURETOR COMPANY

1551 E. Orangethorpe, Fullerton, California
Branch Factory: 2330 W. 58th Street, Chicago, Illinois

GET AHEAD with . . . "YEARS-AHEAD" . . .

Automatic Tube-Ice Machines

Make clear, hard, sized ice in cylinder or crushed form. The refrigerant is applied directly to the freezing surfaces to produce ice with speed and economy. Cold water for process work can also be supplied by these units.



Vogt

ICE MAKING and REFRIGERATING EQUIPMENT

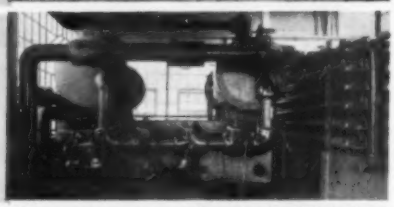
. . . for the preservation of foods and beverages during process and in storage. Petroleum refineries, chemical plants, and related industries also employ this equipment in various processes. In addition to equipment shown here, we manufacture liquid receivers, pipe coils, and valves, fittings, and flanges, for refrigeration as well as for high pressures and temperatures. Bulletins on request. Address Dept. 24A-R10.

Refrigeration Condensers

Available in horizontal multipass shell and tube types and vertical single pass types for Ammonia or other refrigerants. Special metals, lined tubes, etc. can be furnished for unusual operating conditions.

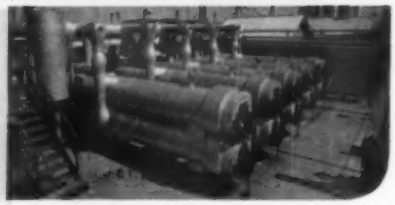
Brine Coolers

Multipass type brine coolers are ideal for closed brine systems in cold storage plants, dairies, packing plants, petroleum refineries, etc. requiring units of large capacity. Also suitable for cooling non-corrosive liquids in general.



Scraped Surface Exchangers

Continuously revolving scrapers sweep heat transfer surfaces clean and keep solids in suspension. Useful in problems of heat transfer with crystallization with high viscosity, or with solvent extraction. Available in double pipe and shell and pipe construction.

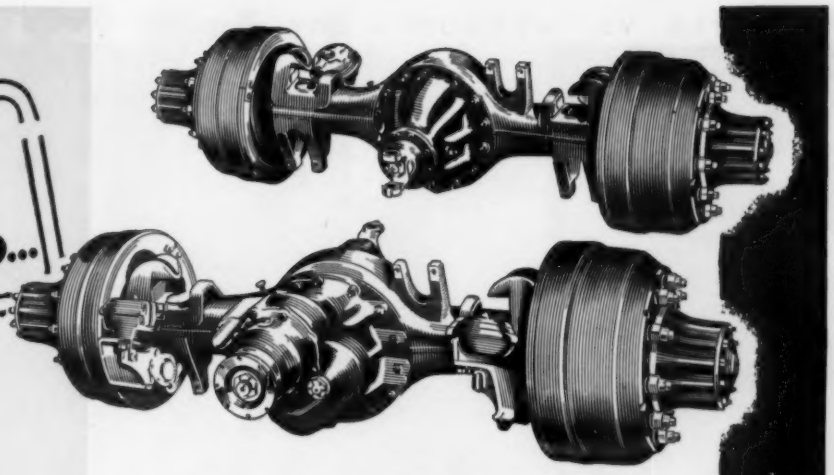


HENRY VOGT MACHINE CO., Louisville, Ky.

SALES OFFICES: New York, Chicago, Cleveland, Dallas, Camden, N. J., St. Louis, Charleston, W. Va., Cincinnati

OTHER VOGT PRODUCTS — DROP FORGED STEEL VALVES, FITTINGS AND FLANGES IN A COMPLETE RANGE OF SIZES • PETROLEUM REFINERY AND CHEMICAL PLANT EQUIPMENT • STEAM GENERATORS

PROVED AND PREFERRED...



For three years..

Timken-Detroit® Lightweight Driving Tandems—First Choice With Big Over-the-Highway Operators!

These superior features make the difference:

Lighter than any comparable tandem on the market . . . but a real heavyweight when it comes to service. Besides increased payloads you get long, trouble-free service and lower operating costs. Time-proved, Timken-Detroit Lightweight tandem features include:

Driver Controlled Inter-Axle Differential. Torque is divided equally between axles, yet wheels of one axle can turn faster or slower than wheels of other axle. This means both axles are always doing equal amounts of work. Driving parts and tires last longer.

"In-Line" Propeller Shaft Drive. With straight-through drive, bearing and gear life is greatly increased because universal joint working angles are materially reduced.

Torsion Flow Axle Shafts. More splines, plus greater root and body diameter, add extra strength.

Hot Forged Rectangular-Shaped Axle Housings. Rectangular shape, combined with full strength corner sections, provides the greatest strength with minimum weight and size. Welded on bowl cover prevents leakage.

Hypoid Gears. Larger pinions and greater tooth contact give 30% more torque capacity, top efficiency and long life . . . plus lower maintenance costs.

Unmatched Parts Interchangeability. Most of the wearing parts—gears, bearings, shafts, differentials, brakes—are interchangeable with parts from Timken-Detroit standard single axles. Parts are readily available and less expensive.

WORLD'S LARGEST MANUFACTURER OF AXLES FOR TRUCKS, BUSES AND TRAILERS

TIMKEN Detroit AXLES
ROCKWELL-STANDARD CORPORATION
TRANSMISSION AND AXLE DIVISION
DETROIT 32 MICHIGAN
Accepted A Standard
TRADE MARK REGISTERED

©1958, R-S Corp.

Products of **ROCKWELL-STANDARD** Corporation

Pressure vs. vacuum—one valve holds both in line

Gauge test of Crane flexible wedge disc gate valve shows no leakage around disc.

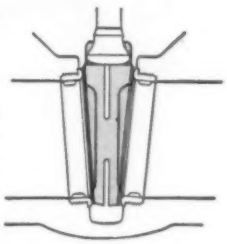
How one CRANE valve controls two-fluid process

To prevent intermixing of steam and very light hydrocarbon in a butadiene production process, the Texas Butadiene & Chemical Corp., Channelview, Tex., uses only one valve. This is unusual; the old method of double blocking required two valves.

The single valve being used is a Crane flexible wedge disc gate. In the operating cycle, this 6-inch, 400-pound air-cylinder operated valve opens or closes every seven to nine minutes. In closed position, one side of the disc holds steam at 20 psi. The other side holds light hydrocarbon at 24 inches mercury vacuum.

This dual service, combined with constant cycling, is beyond an ordinary wedge gate or plug type valve. But not beyond the Crane flexible wedge disc! It has prevented leakage and product contamination month after month on this tough service.

For full information about the efficiency and obvious economies of using Crane flexible wedge disc gate valves, see your Crane Representative or write to address below.



Positive wedging principle of Crane flexible wedge disc gate valve.

CRANE VALVES & FITTINGS

PIPE • PLUMBING • KITCHENS • HEATING • AIR CONDITIONING

Since 1855—Crane Co., General Offices: Chicago 5, Ill. Branches and Wholesalers Serving All Areas

Cementing and fracturing hose of steel, comprising Chiksan Joints and Weco Unions, have long been standard equipment with service companies.

new NEW

Chiksan has developed a new kind of swivel joint for oil well cementing. This joint has a wide turning radius and a new process-hardened steel to minimize cavitation and washout, plus a new wedge-shaped packing that cannot be sucked into the stream. It's called the Longsweep and it has produced highly spectacular results.

In two years of field testing, this new joint has proved itself better than any previous cementing joint ever used. Cementers report a minimum of 3-to-1 service life over old joints. This newest development is another Chiksan effort to reduce drilling costs.

CHIKSAN *Longsweep* SWIVEL JOINT

triples cementing hose service life . . .

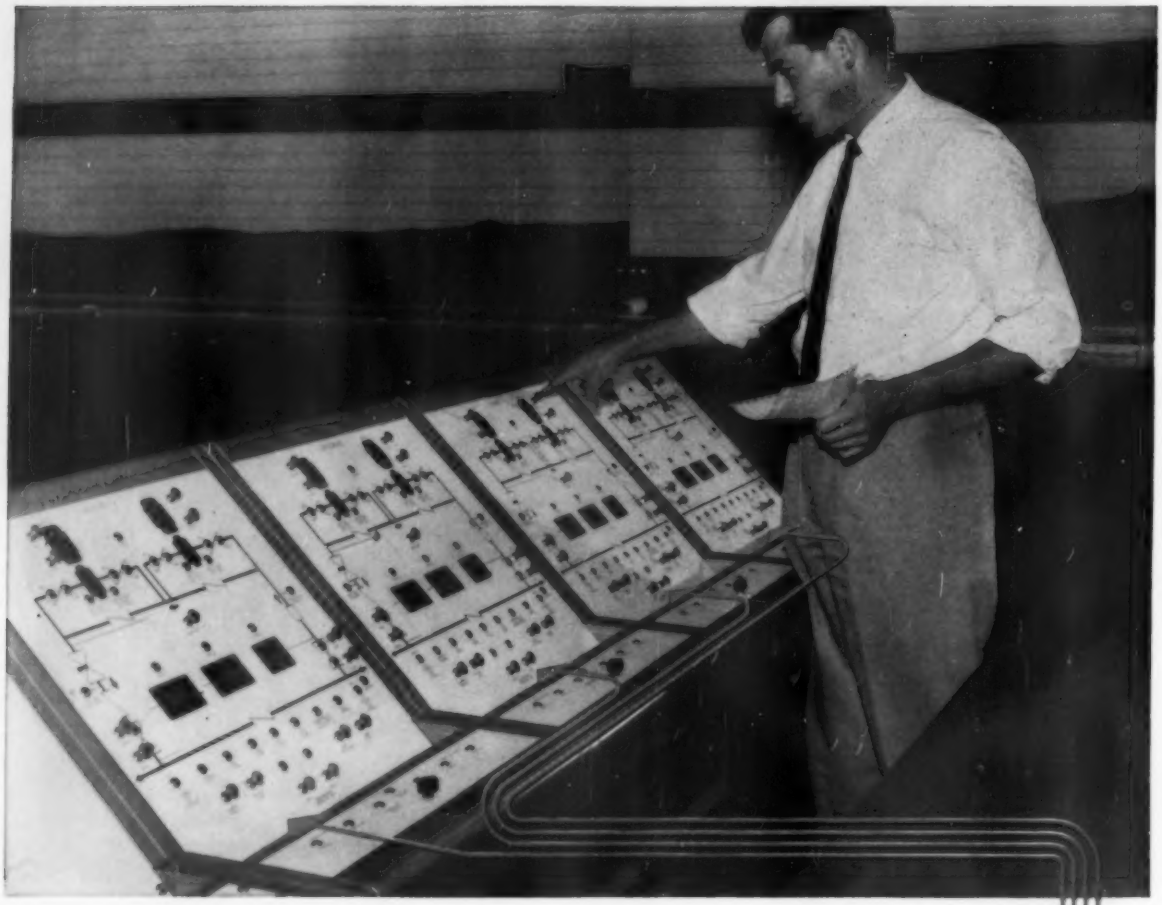
CHIKSAN fmc

A SUBSIDIARY OF FOOD MACHINERY AND CHEMICAL CORPORATION

58-35

CHIKSAN COMPANY—Brea, Calif. • Chicago 5, Ill. • Newark 2, N. J. • Weco (Division), Houston 1, Texas • Subsidiaries: Chiksan Export Co. • Chiksan of Canada, Ltd.

Union Centralized Transport Control pays



LOS ANGELES CONTROLLING OFFICE—The heart of the whole operation is in Los Angeles where one man at the control console can supervise the operation of four unattended pump stations 643 to 804 miles away. The operator has complete information before him showing conditions all along the line.

PHOENIX
Output Terminal

TUCSON
Output Terminal

APACHE
Unattended Booster Pump Station

REMOTE CONTROL—Either pumping unit at any one of the four booster stations can be started or stopped from Los Angeles. The sequence in opening and closing valves and starting and stopping pumps is all handled automatically and correctly by the control system.

off for Southern Pacific Pipe Lines

Push a button in Los Angeles

and four pump stations throb into action out on the desert over 600 miles away

Union Switch & Signal equipment controls operating sequence and telemeters operation of 33,000 bbl/day products line

FLEXIBILITY and fail-safe operation are the keynotes of the new pipeline system operated by Southern Pacific Pipe Lines, Inc. The line is used to transport refined products such as gasoline, jet fuel, diesel oil, etc., from El Paso, Texas, to Tucson and Phoenix, Arizona. All Centralized Transport Control equipment for four unattended booster stations was supplied by Union Switch & Signal.

REMOTE or LOCAL: All four booster stations are normally controlled from Los Angeles. Any station can be controlled locally, when desired. In any case, continuous pressure and suction readings are displayed on the console at Los Angeles and automatically recorded every fifteen minutes by an automatic typewriter. Any malfunction, at any point in the system, is indicated on the console. The equipment affected is shut down automatically and cannot be started again until the trouble has been cleared.

COMMUNICATION: Four telegraphic-type communications lines, owned by Southern Pacific, are used to transmit control codes to the stations and telemetered information back to Los Angeles. Each line serves one station. An additional commercial communications line serves as a stand-by for all four stations. Signals are coded to prevent noise or interference from causing faulty operation or indication.

MAXIMUM EFFICIENCY: The Centralized Control system, designed and installed by Union Switch & Signal Division of Westinghouse Air Brake Company, cuts down the chance for expensive error. It keeps the Southern Pacific Scheduling Department in Los Angeles informed, at all times, of exactly what is happening in the field. It speeds operation, adds security and reliability.

Union Switch & Signal has designed many successful custom systems for pipeline companies. And now out of that experience, it has developed standardized central control systems that cut costs, add flexibility, and save space, as well as making pipeline control extremely reliable.

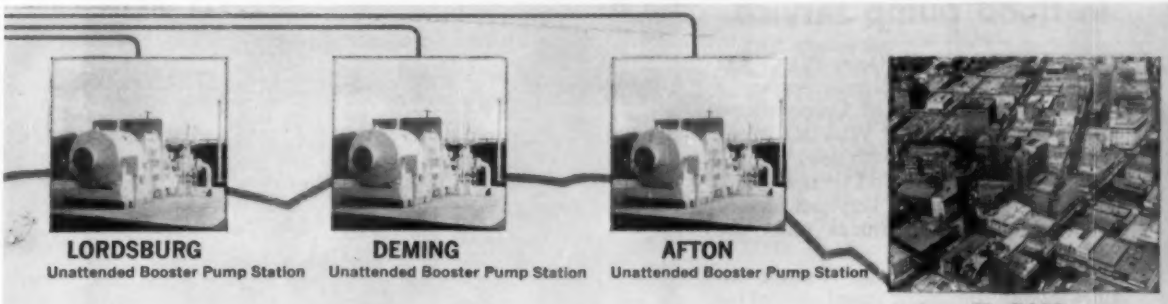
"Pioneers in Push-Button Science"

UNION SWITCH & SIGNAL

DIVISION OF WESTINGHOUSE AIR BRAKE COMPANY

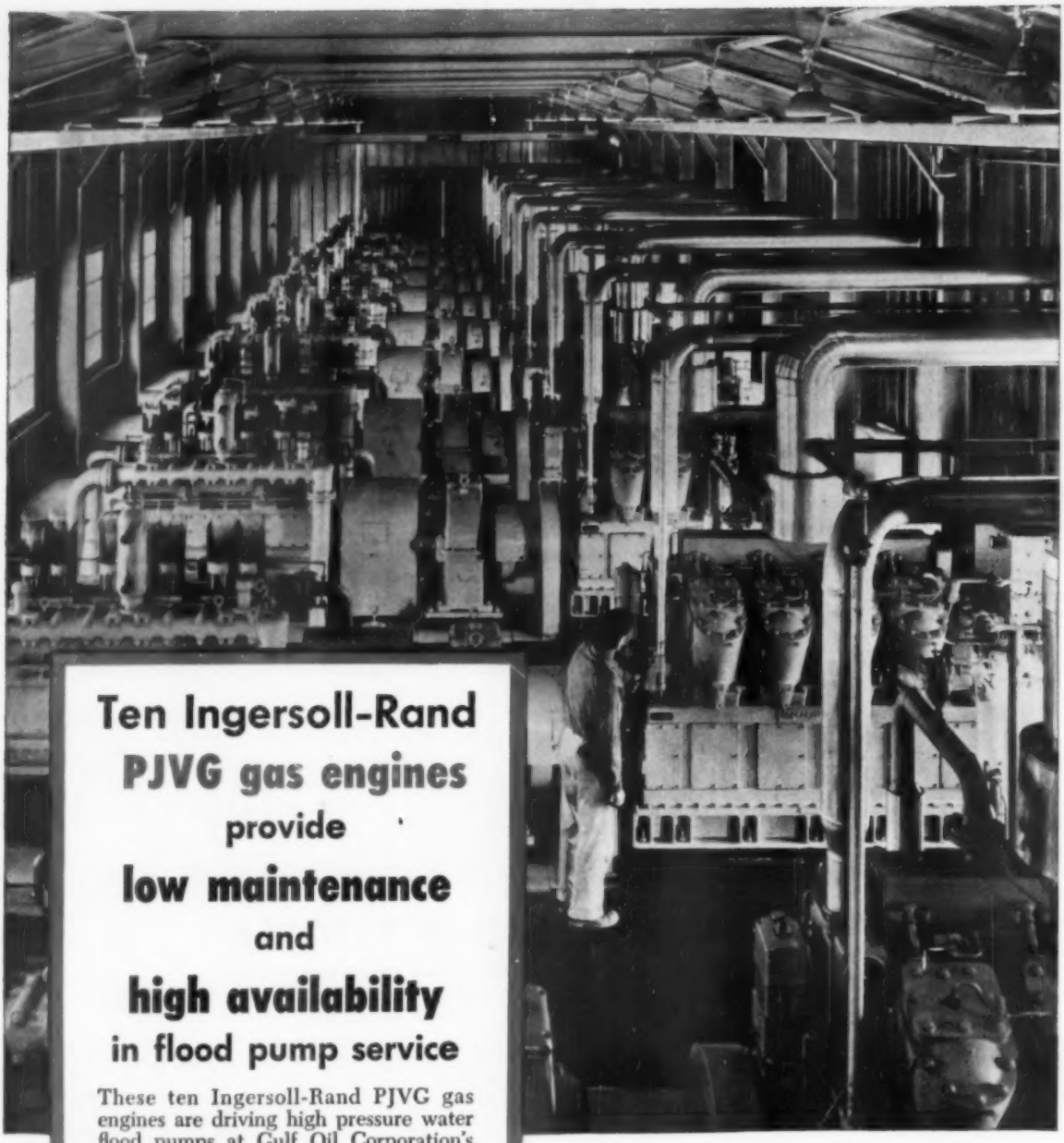
SWISSVALE, PENNSYLVANIA

NEW YORK • PITTSBURGH • CHICAGO • SAN FRANCISCO



LOCAL CONTROL—Operation also can be controlled automatically at the pump station. Or the station can be run manually. The choice is up to the local station. But Los Angeles always knows which mode of control is being used and always receives a continuous flow of system information.

THE FUTURE—Southern Pacific Pipe Lines, Inc. can already see opportunity to make this system more automatic and more efficient. They plan, in time, to be able to let stations adjust automatically to proper unit operation when an upstream or downstream station goes off the line.



Ten Ingersoll-Rand PJVG gas engines provide low maintenance and high availability in flood pump service

These ten Ingersoll-Rand PJVG gas engines are driving high pressure water flood pumps at Gulf Oil Corporation's North Ward-Estes Unit, Wickett, Texas. They have been in continuous service since December, 1954, and service attention has been held to a very satisfactory minimum. Three additional units are on order.

These 295-hp four-cycle, V-angle engines include automatic speed control for varying water volume and pressure.

For service-proved dependability in round-the-clock service—with smooth control and long-run economy—look into the advantages of Ingersoll-Rand 4-cycle V-angle gas engines. They are available in sizes from 220 to 2000 hp. Ask your I-R representative for complete details.

4-CYCLE

Ingersoll-Rand

6-709 11 Broadway • New York 4, N.Y.

COMPRESSORS • GAS & DIESEL ENGINES • AIR & ELECTRIC TOOLS
PUMPS • CONDENSERS • ROCK DRILLS • VACUUM EQUIPMENT

Timken® seamless steel tubes with 125,000 psi yield strength let you drill as deep as you want

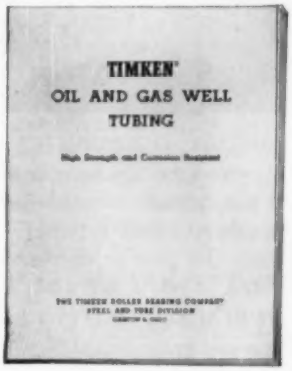
IMAGINE a steel tube so strong you can drill as deep as you want—without pressure problems. Timken® seamless steel tubes with yield strength of 125,000 psi, are 20% stronger than the stiffest API requirement (5A). They can take internal pressures up to 15,000 psi. The well hasn't been drilled yet that this tubing can't handle. Timken seamless steel tubes are the tubes for the increased pressures of the wells you're planning for the future.

When you specify Timken seamless steel tubes, you get a steel of exceptional uniformity and ductility. And to lick your corrosion problems, you can choose from a wide range of analyses to get just the right grade to resist the particular operating conditions you're faced with.

Timken Company metallurgists will be glad to help you select the right steel to do the job. Why not take advantage of their experience—24 years of making high pressure seamless tubes for thousands of special requirements.

FREE ENGINEERING STUDY

You may get some money-saving ideas from this review of alloy properties for high-strength and corrosion-resistant steel tubes. Get your free copy of "Timken Oil and Gas Well Tubing." Write today! The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

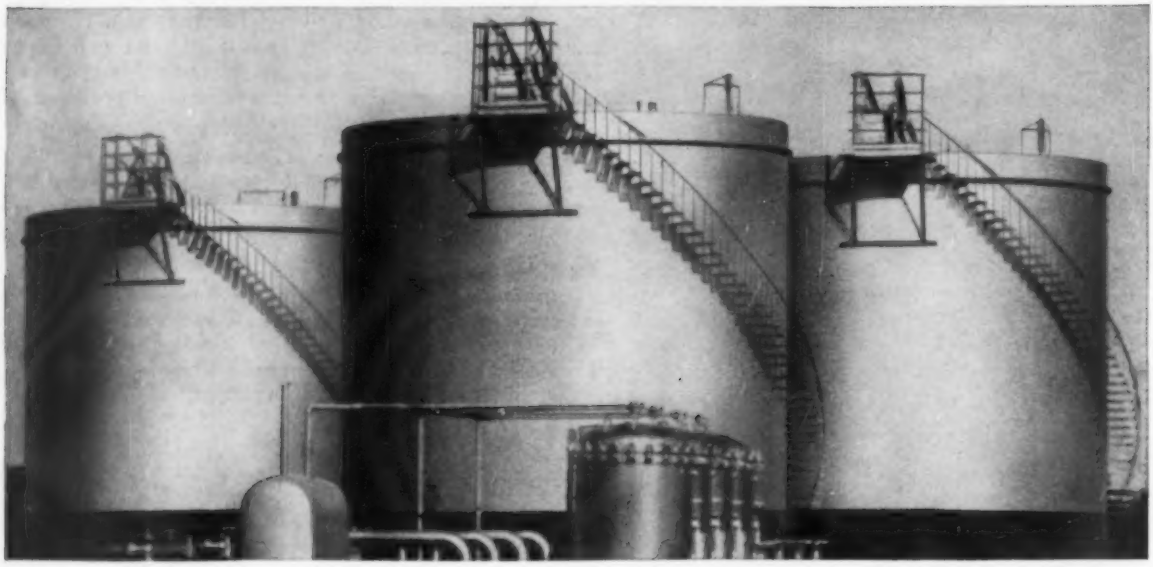


TIMKEN *Fine Alloy* STEEL

TRADE-MARK REG. U. S. PAT. OFF.

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING

HAMMOND TUBESEALS* USHER IN *THE JET AGE*



FUELING THE PURE JETS at the International Airport, New York took special equipment and the know-how gained in fueling Viscounts and Britanias, says Petroleum Marketer in their November 1958 issue... also featured in their article about this pure jet installation is the equipment used... ***"ALL ABOVE GRADE TANKS ARE HAMMOND TUBESEAL FLOATING ROOF TYPE"***... this terminal is owned by the Port of New York Authority and is operated by Allied New York Service, Inc.

Tubeseal Floating Roofs were selected for this and hundreds of other installations all over the world for the very characteristics of their design and construction: no vapor space between seal and product—no moving parts—climate proof—noncorrodible—protects product from rim and lightning fires—operates from top to bottom of tank—entire circumference tightly sealed under pressure at all times.

For storing jet fuels, gasolines, sour crudes, light crudes, alcohol, naphthas, polyester or similar products, the Hammond Tubeseal System is the most efficient and positive seal known.

** Tubeseal system*

James P. O'Donnell Consulting Engineer

HAMONDTANK

HAMMOND IRON WORKS

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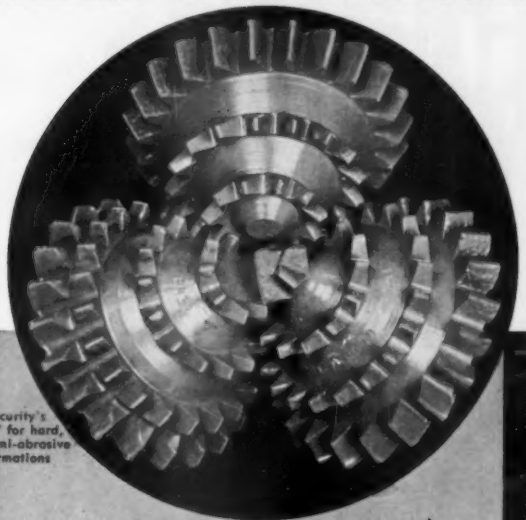
ANOTHER REASON WHY SECURITY BITS PACE THE INDUSTRY:

Security Gives You QUALITY-TESTED BITS

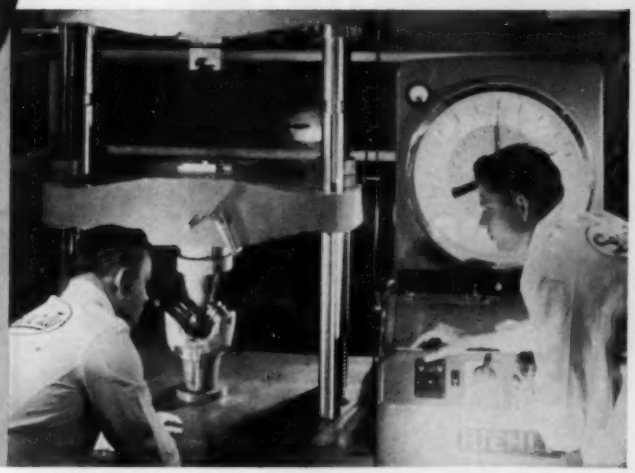
— checked by a minimum of

276 INSPECTIONS PER BIT!

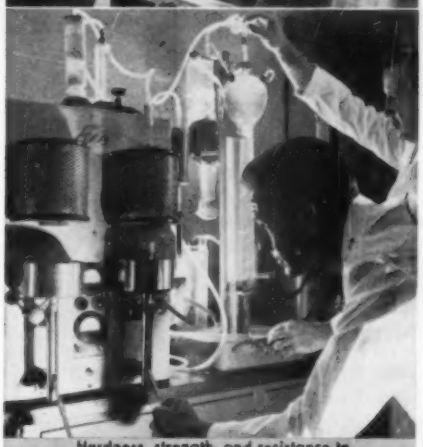


Security's H7 for hard, semi-abrasive formations

The tensile and compression strength of bit components and bit assemblies are tested by use of Universal load-test equipment capable of producing weight loads of 60 tons.



The crystalline alignment of steel, here being determined by X-ray diffraction, affects the ultimate performance where strength, fatigue, impact, and hardness are important factors.



Hardness, strength, and resistance to abrasion are related to carbon content. Security controls carbon content in both raw materials and finished parts by frequent checks using induction volumetric analytical equipment.

AVAILABLE THROUGH YOUR FAVORITE ACCREDITED SUPPLY STORE.

Deeper and faster drilling plus new and more effective drilling methods have created rugged demands on rock bit construction. Security rock bits are designed and manufactured to meet present-day drilling requirements.

Security's exceptionally rigid inspection procedures insure that design and manufacturing specifications are met. Beginning with careful testing of mill samples of steel and continuing through all manufacturing operations, a minimum of 276 inspections is required to insure Security's high quality bit construction.

These inspection procedures include: chemical and spectrographic analyses . . . carbon determination . . . tensile and compression testing . . . magnaflux . . . metallographic examination . . . surface, dimensional, and environmental testing.

Special inspection methods developed by Security—and used exclusively by Security—further assure the *dependable* high quality of Security rock bits. Every Security bit is inspected through every stage of its development and construction. This extra care in manufacturing bits assures you of Security's greater down-hole dependability.

Write for further information about Security QUALITY-TESTED rock bits.

Security®

PRECISION BITS SINCE 1931

PLANTS: Dallas, Tex. • Whittier, Calif. Manchester, England

SECURITY ENGINEERING DIVISION, 3400 W. Illinois, Dallas, Tex.

EXPORT OFFICE: P. O. Box 13647, Dallas, Texas

CANADA: Security Eng. Canada, Ltd., Edmonton, Alberta, Canada

W. HEMISPHERE: Security International C.A., Caracas, Venezuela

E. HEMISPHERE: Security International C.A., London, England

Plan to stay ahead... MODERNIZE!

ALLIS-CHALMERS

ALLIS-CHALMERS
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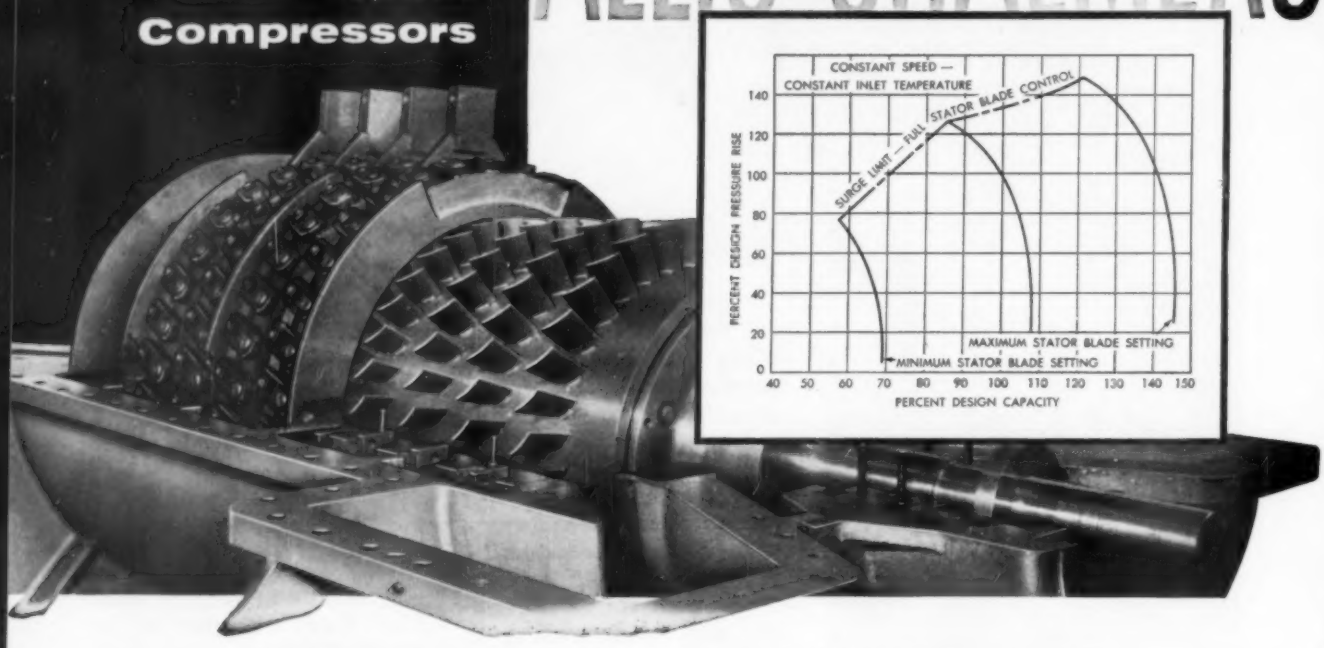
ALLIS-CHALMERS

NEW

Adjustable Stator Blade Axial Compressors



Get wide capacity range at high efficiency

WITH adjustable stator blade control, now available on Allis-Chalmers axial compressors, varying capacity needs can be met by merely changing stator blade settings — while the machine is in operation. Limited operating range need no longer be a problem.

In fact, Allis-Chalmers axial compressors can now be used with almost the same capacity variation as the centrifugal, while maintaining the axial's characteristic high efficiency and pressure rise at part load points.

For details on the adjustable stator blade axial compressor, call your nearby A-C office, or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.

These additional advantages are inherent in axial compressor performance:

1. Because of the axial's wide range at constant speed, either steam turbine or motor drive can be used.
2. Small size, light weight of axial units cut space requirements, reduce foundation size and cost.
3. High compressor efficiency reduces horsepower required in driving an axial as much as 12%, compared with other compressor types.

ALLIS-CHALMERS A-C

A-5839

RUST-OLEUM®

STOPS RUST!®

and matches ORIGINAL EQUIPMENT

COLORS

Distinctive as your own fingerprint. Accept no substitute.

How much does rusty equipment cost *you*? With Rust-Oleum, you STOP RUST—and you match original equipment colors, too, for long-lasting protection!

We want you to see for yourself how *easy* it is to use Rust-Oleum . . . actually take the brush and see how smoothly it works, how it dries to an *attractive, high-gloss finish* that resists sun, fumes, rain, heat, snow, salt air and salt spray, and blowing dust and sand. And the same formula can be applied by brush or spray. Just check the coupon for the color you want . . . and attach it to your business letterhead for a FREE TEST SAMPLE. No cost or obligation.

Your Rust-Oleum Distributor maintains complete stocks for immediate delivery.

ATTACH COUPON TO YOUR BUSINESS LETTERHEAD FOR FREE TEST SAMPLE

CHECK COLOR TO MATCH YOUR EQUIPMENT

RUST-OLEUM CORPORATION, 2620 Oakton St., Evanston, Ill.
Please send me a FREE TEST SAMPLE in the color checked.

- ☐ 769 Damp-Proof Red Primer
- ☐ H-50 Primer
- ☐ 634 Quick Drying Black
- ☐ 2766 High Gloss White
- ☐ 470 Ready Mixed Aluminum
- ☐ H-4 Caterpillar Yellow
- ☐ 722 Bethlehem Yellow
- ☐ 728 Old Emsco Green
- ☐ 726 New Emsco Green
- ☐ 727 New Unit Rig Gray
- ☐ 724 Waukesha Gray
- ☐ 725 New National Blue
- ☐ 723 Oil Well Orange

FALK and STEELFLEX are Registered Trademarks

Cut disconnect-reconnect time by as much as 50%

The FALK Spacer Coupling is specially designed for quick installation or removal *without disturbing the driving or driven unit.* This feature can save you up to 50% in disconnect-reconnect time when critical equipment—a process pump, for example—needs repair or replacement.

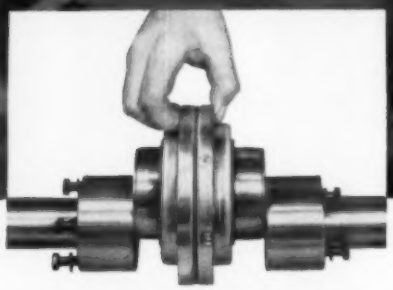
Here's another saving: with the FALK Spacer Coupling, you can quickly realign shafts *without the usual loss of operating temperature!*

And still another: you can remove or reinstall the FALK Spacer as a unit *without draining the lubricant.*

Because of its exclusive grid-groove Steelflex design, the FALK Spacer can accommodate residual misalignment—parallel, angular, or (most important) *both.* Also, it provides torsional resiliency that cushions shock and vibration. Thus it saves wear-and-tear on your connected equipment.

To prove these claims and enjoy these savings, install a FALK Spacer on one application—and see for yourself. Consult your FALK Representative or Authorized Distributor.

THE FALK CORPORATION, MILWAUKEE 1, WISCONSIN
MANUFACTURERS OF QUALITY GEAR DRIVES AND FLEXIBLE SHAFT COUPLINGS
Representatives and Distributors in many principal cities.

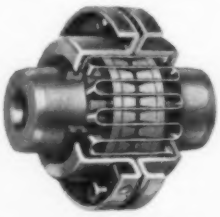


EASY AND QUICK TO INSTALL, DISCONNECT OR RECONNECT

First, mount shaft hubs to allow proper distance between hubs; then, align driving and driven units.

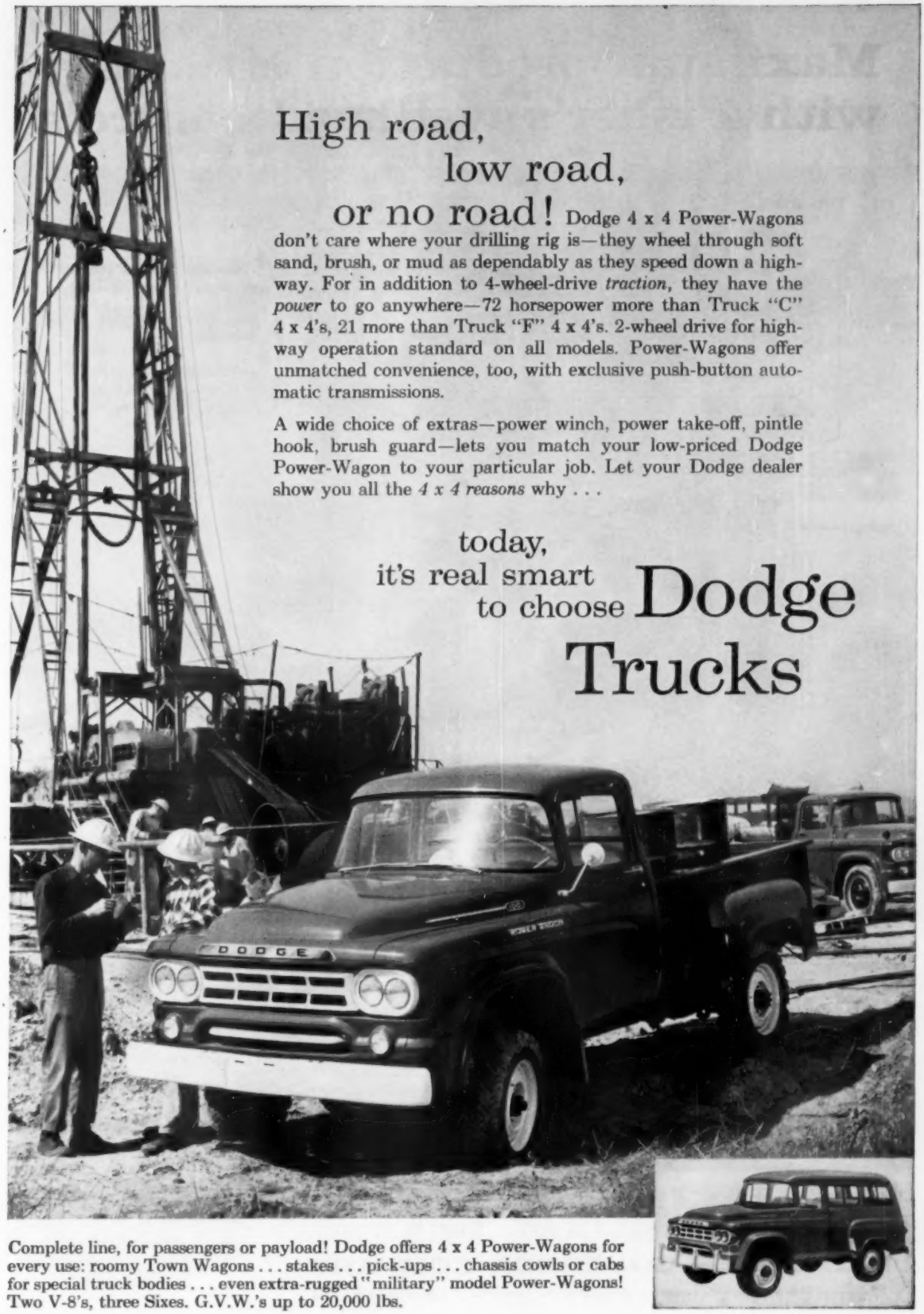
Second, compress Spacer to fit space between hubs and tighten cap screws to pull spacer hubs into the registered fit.

To disconnect, reverse the second step. No draining of lubricant necessary.



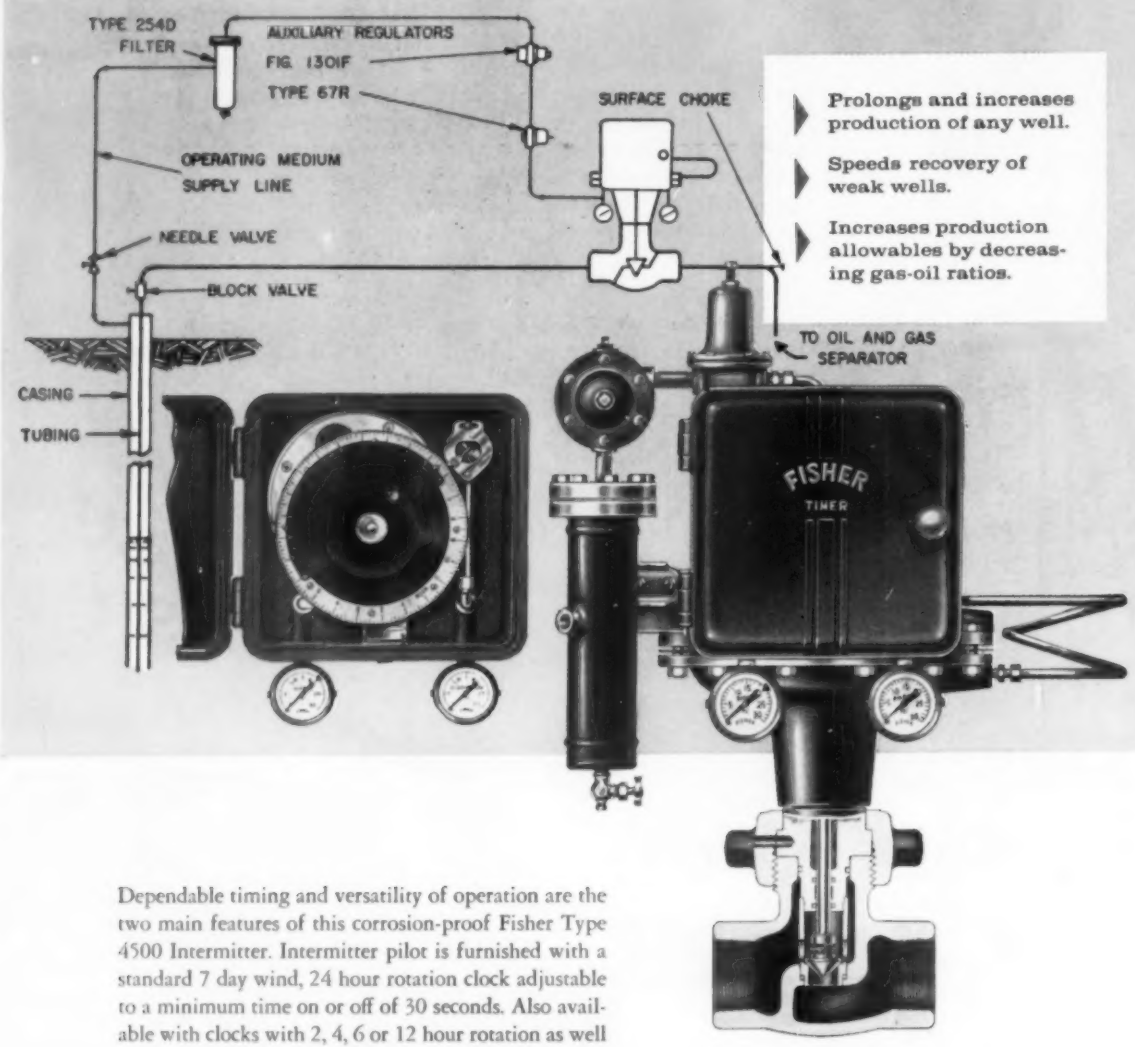
The heart of the FALK Spacer ...the basic Type F Steelflex
Write for Service Manual 4838

FALK
...a good name in industry


High road,
low road,
or no road!
Dodge 4 x 4 Power-Wagons don't care where your drilling rig is—they wheel through soft sand, brush, or mud as dependably as they speed down a highway. For in addition to 4-wheel-drive *traction*, they have the *power* to go anywhere—72 horsepower more than Truck "C" 4 x 4's, 21 more than Truck "F" 4 x 4's. 2-wheel drive for highway operation standard on all models. Power-Wagons offer unmatched convenience, too, with exclusive push-button automatic transmissions.
A wide choice of extras—power winch, power take-off, pintle hook, brush guard—lets you match your low-priced Dodge Power-Wagon to your particular job. Let your Dodge dealer show you all the *4 x 4 reasons* why . . .
today,
it's real smart
to choose Dodge
Trucks
DODGE

Complete line, for passengers or payload! Dodge offers 4 x 4 Power-Wagons for every use: roomy Town Wagons . . . stakes . . . pick-ups . . . chassis cowls or cabs for special truck bodies . . . even extra-rugged "military" model Power-Wagons! Two V-8's, three Sixes. G.V.W.'s up to 20,000 lbs.

Maximum production efficiency with Fisher's wellhead controls



- Prolongs and increases production of any well.
- Speeds recovery of weak wells.
- Increases production allowables by decreasing gas-oil ratios.

Dependable timing and versatility of operation are the two main features of this corrosion-proof Fisher Type 4500 Intermitter. Intermitter pilot is furnished with a standard 7 day wind, 24 hour rotation clock adjustable to a minimum time on or off of 30 seconds. Also available with clocks with 2, 4, 6 or 12 hour rotation as well as clocks with electric drive. Reverse action can be easily achieved by simply rotating relay cap 180°. Complete information is available on the Fisher Type 4500 Intermitter by requesting Bulletin O-4500.

FISHER TYPE 4500 INTERMITTER
Mounted on a Type 125-P Field Valve.

IF IT FLOWS THROUGH PIPE ANYWHERE IN THE WORLD . . . CHANCES ARE IT'S CONTROLLED BY

FISHER GOVERNOR COMPANY

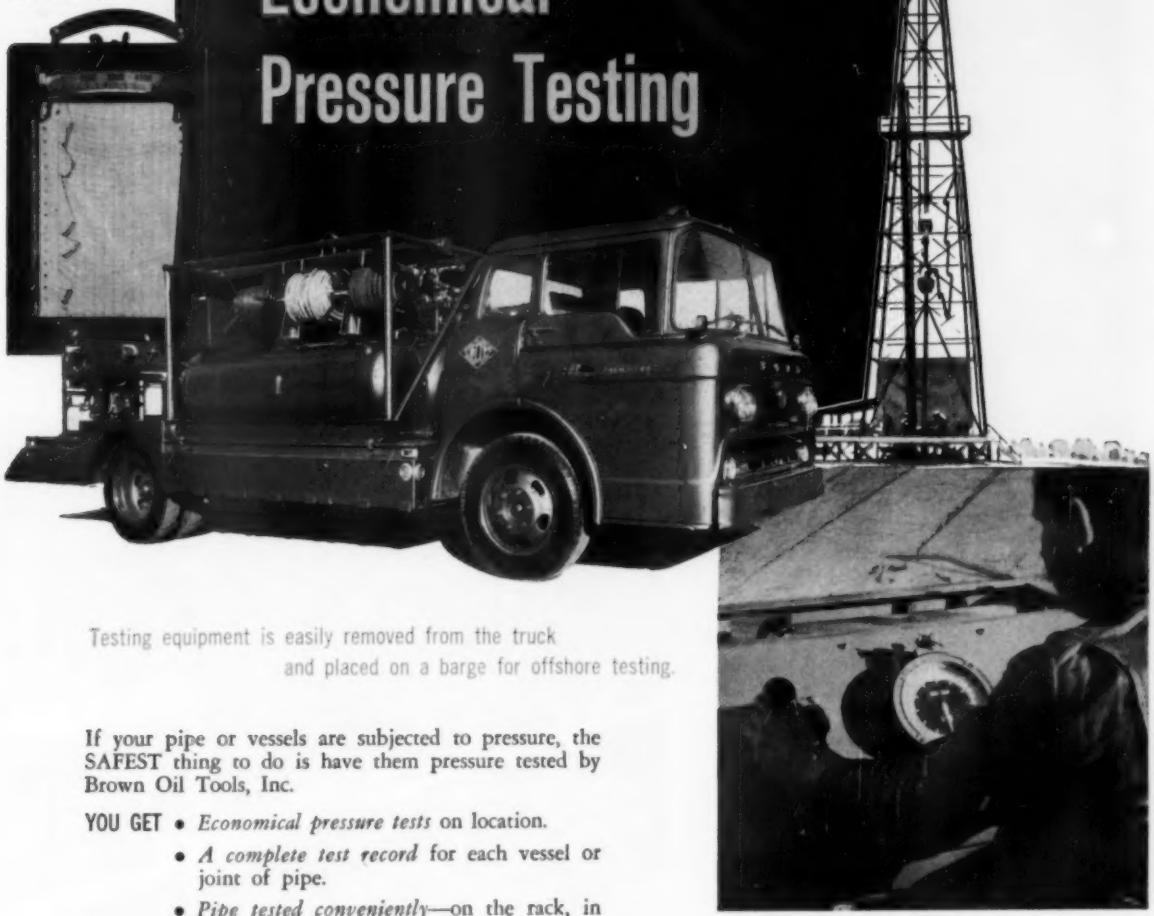
Marshalltown, Iowa / Woodstock, Ontario / London, England

FISHER Controls

SINCE 1880

Modernized Equipment Assures Safe, Fast, Economical Pressure Testing

Recording Instrument



Testing equipment is easily removed from the truck and placed on a barge for offshore testing.

If your pipe or vessels are subjected to pressure, the SAFEST thing to do is have them pressure tested by Brown Oil Tools, Inc.

YOU GET
- *Economical pressure tests* on location.
- *A complete test record* for each vessel or joint of pipe.
- *Pipe tested conveniently*—on the rack, in the yard, on the truck, standing in the derrick or going in the hole.
- *The most modern testing equipment* capable of developing 20,000 lbs. pressure. Pre-set pressure controls allow only the amount needed.
- *A fast, neat test.* The testing fluid is recovered and used over and over again.
- *A sure test* since the equipment is operated from a control panel at the job site.

You can't afford to take the risk of using faulty pipe or vessels. Be sure . . . be safe . . . the economical way . . . with the Brown Hydrostatic Pressure Testing Unit.

Call the Brown Oil Tools Office nearest you.

Control Panel

Unit available for sale in all areas outside the United States.

BOT
BROWN
OIL TOOLS, INC.

8490 KATY ROAD • HOUSTON, TEXAS

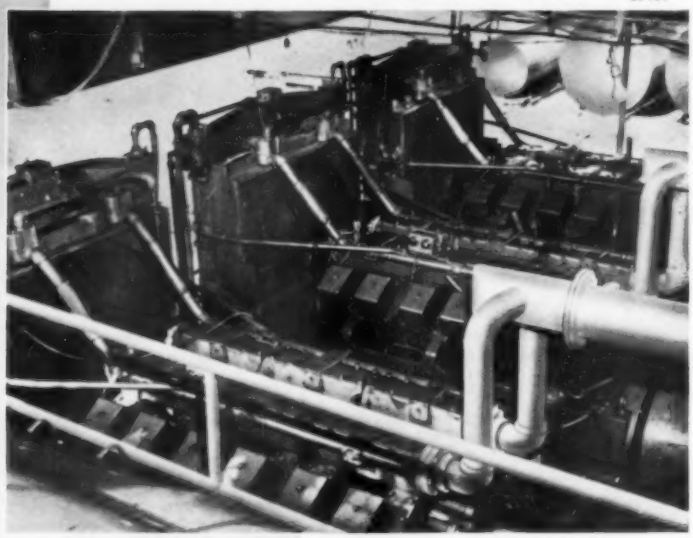
five CLIMAX V-125 ENGINES

power Rig No. 2 of Big Chief Drilling Co.

This Magnolia Petroleum Co. well in the old Cement Field of Caddo County, Oklahoma, was drilled to 20,426 ft. by Big Chief Drilling Co. Rig No. 2. The rig's National drawworks is powered through a compound by three V-125 Climax engines with a combined maximum of 1815 hp . . . and a V-125 Climax engine powers each of the two Gardner-Denver PL-7 mud pumps.

The V-125 Climax is a 3711 cu. in. engine—V-type, 12-cyl., 7-in. bore x 7½-in. stroke—easy to start . . . simple to operate . . . burns natural gas, butane, or propane with equal efficiency, and great economy . . . and its accessibility makes maintenance easy. From its separately cast cylinder blocks with their renewable sleeves to the cylinder heads' high turbulence combustion chambers—V-125 Climax is built for its work and it keeps on working. Send for descriptive bulletin.

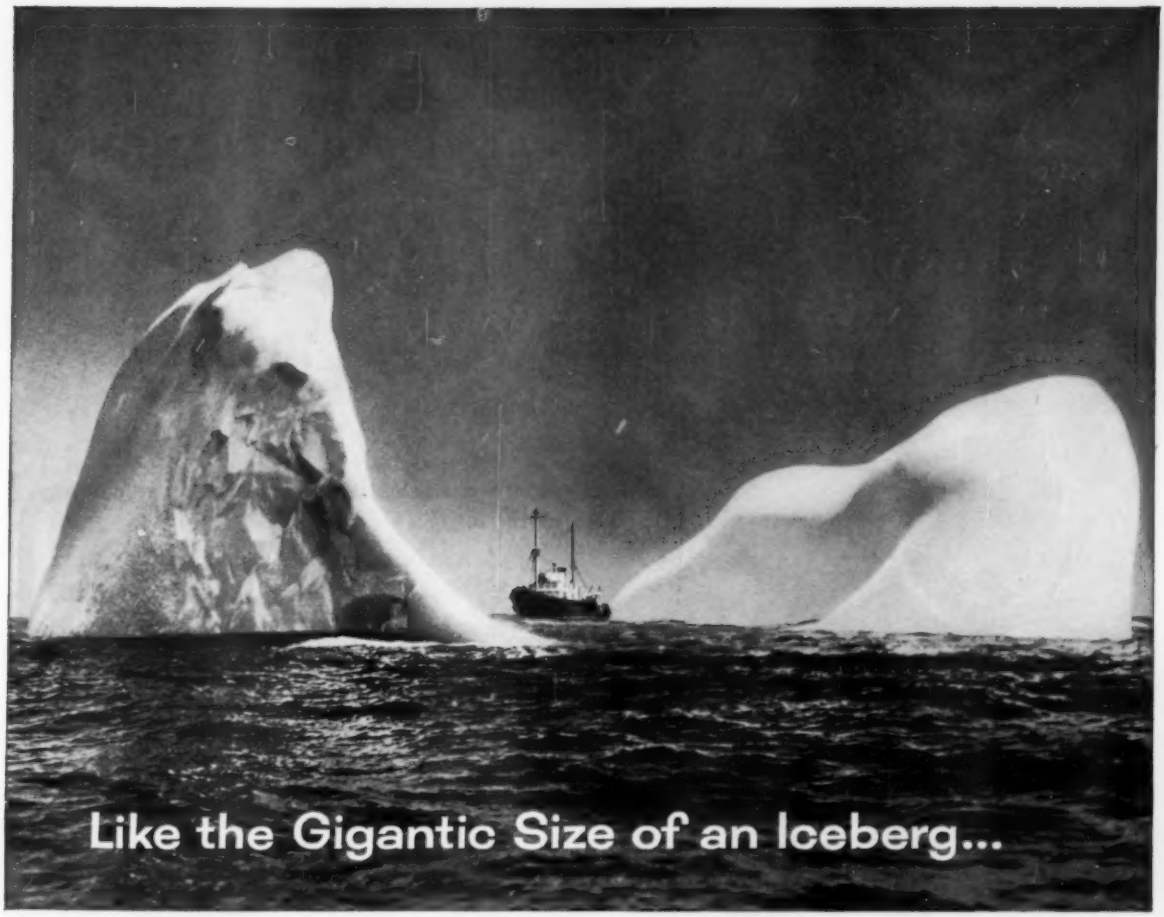
CL 101



CLIMAX ENGINE MANUFACTURING CO.

Factory—Clinton, Iowa

DIVISION OF WAUKESHA MOTOR COMPANY



there's more to Cities Service than meets the eye!

Mammoth as it may appear to the eye, an iceberg is normally eight times the size of its visible portion. Seven-eighths lies submerged and unseen beneath the surface.

Few spectacles of nature are so awesome as the iceberg. Hundreds of yards in length, it rises 100 feet or more above the sea, with crests or minarets spiring higher to 200 and even 300 feet.

Yet, only about one-eighth of an iceberg's mass rides in view. The great bulk lies hidden in the ocean depths.

Similarly unseen by most of the public they serve are the far-flung facilities of petroleum enterprise—towering derricks in the oil fields—mighty refineries—thousands of miles of pipeline—fleets of ocean-going tankers—wonderful modern laboratories.

Costly? Yes—the capital invested in the business of a major oil company such as Cities Service exceeds a billion dollars. Without these facilities and the skilled men and women who operate them, the American petroleum job could not be done... and petroleum, next to food, is America's most vital product today.

CITIES SERVICE

NO OIL – NO AIR . . . NORWOOD CONTROLS

VALVE POSITIONER IS

ALL ELECTRIC

Norwood Controls Valve Positioner mounted on 4-inch double-seated valve.

Maintenance problems drop almost to zero when you install Norwood Controls' new all-electric Valve Positioner. No air or hydraulic leaks, no cleaning, no expensive auxiliary equipment . . . just one, efficient, pre-lubricated, all-electric unit that operates from −40°F to 170°F.

For further information, write for data sheet B158-5. Norwood Controls Unit, Detroit Controls Division, 942 Washington Street, Norwood, Mass.

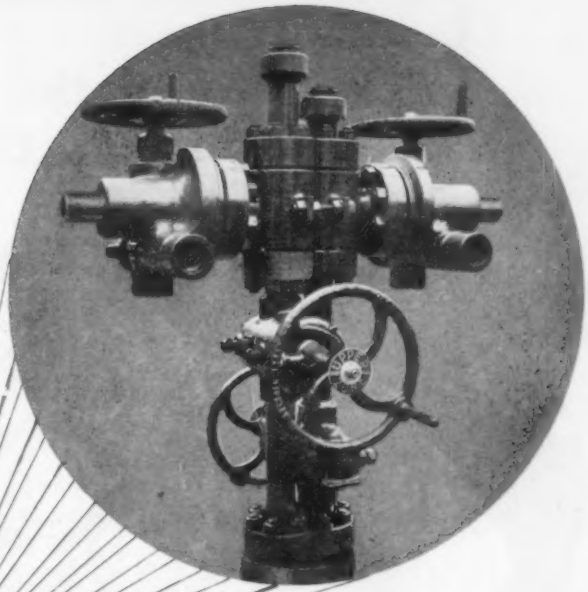
American-Standard Products

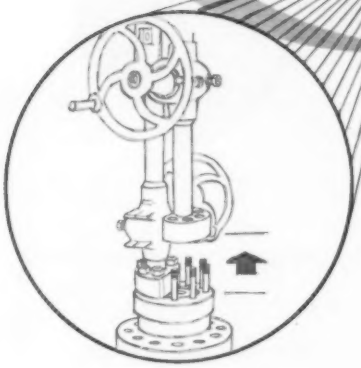
AMERICAN-Standard

DETROIT CONTROLS DIVISION

O·C·T

CRESCENT FLANGE





gives dual tree flexibility, economy

Another major advancement from the leader in multiple well completion equipment is incorporated in the Oil Center Tool Company's Crescent Flange Tree.

It features: ★ Simplicity ★ Flexibility ★ Economy

All of these result from the fact that it is no longer necessary when the Crescent Flange Tree is used, to remove both valves in a dual well when one is to be replaced. The ultra-simple design allows you to replace one valve without disturbing the other.

The Crescent Flange Tree is the newest example of how the Oil Center Tool Company employs depth in research and development to deliver the best possible wellhead equipment.

For more details on the Crescent Flange Tree, check with the O-C-T representative nearest you. You'll be glad you did.

where progress is a daily practice

O·C·T

OIL CENTER TOOL CO.

SUBSIDIARY OF FOOD MACHINERY AND CHEMICAL CORPORATION

Address Export Inquiries for All Countries to P. O. Box 3091, Houston, Texas.

This is Why the Nash is the Most Simple Compressor

It's the Nash!

There are no mechanical complications in a Nash Compressor. A single moving element, a round rotor, with shrouded blades, forming a series of buckets, revolves freely in an elliptical casing containing any low viscosity liquid. This liquid, carried with the rotor, follows the elliptical contour of the casing.

The moving liquid therefore recedes from the rotor buckets at the wide part of the ellipse, permitting the buckets to fill with gas from the stationary Inlet Ports. As the casing narrows, the liquid is forced back into the rotor buckets, compressing the gas, and delivering it through the fixed Outlet Ports.

Nash Compressors produce 75 lbs pressure in a single stage, with capacities to 6 million cu. ft. per day in a single structure. Since compression is secured by an entirely different principle, gas pumping problems difficult with ordinary pumps are often handled easily in a Nash.

Nash simplicity means low maintenance cost, with original pump performance constant over long periods Data on these pumps sent immediately on request

No internal wearing parts.

No valves, pistons, or vanes.

No internal lubrication.

Low maintenance cost.

Saves floor space.

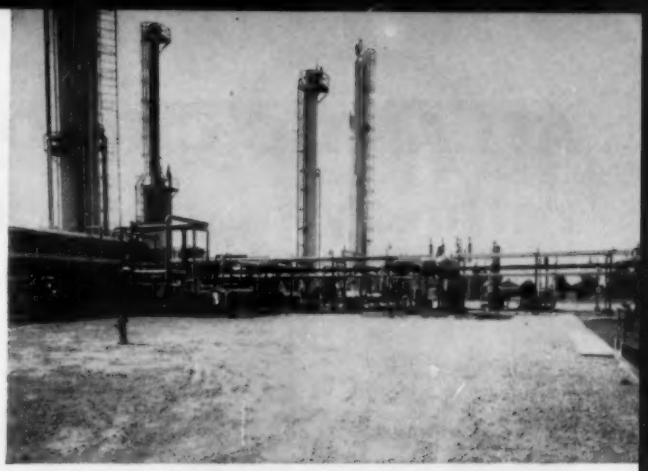
Desired delivery temperature automatically maintained.

Slugs of liquid entering pump will do no harm.

75 pounds in a single stage.

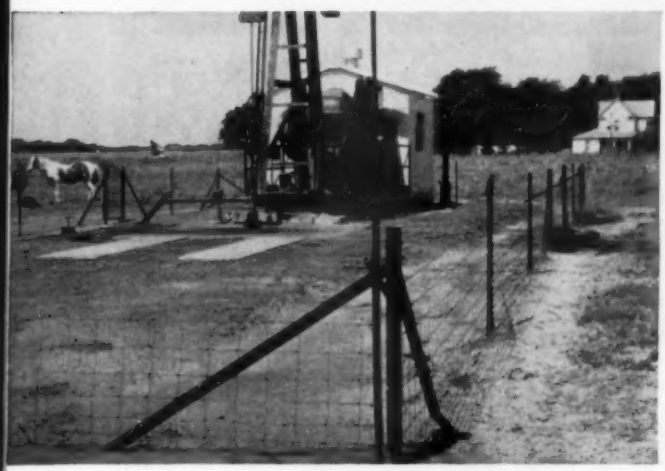
NASH ENGINEERING COMPANY
313 WILSON, SO. NORWALK, CONN.

• Note the complete control of fire-hazardous vegetation with "Telvar" around these pipelines of the Tidewater Oil Co., which pass largely through a marshy area. Without "Telvar", weed control would have required costly hand labor.



• In this refinery of the Cities Service Oil Co., "Telvar" applied in May kept area weed-free entire season. In the oil industry, fire hazards and maintenance problems are greatly reduced by weed control with "Telvar" and "Karmex".

Avoid fire hazards...reduce maintenance costs spray just once with a Du Pont Weed Killer for season-long control



• "Telvar" was applied around this producing well of the Phillips Petroleum Co. in April, and this photo was taken five months later. "Telvar" and "Karmex" are non-volatile, non-corrosive, non-flammable . . . can be applied in producing fields without damage to property or hazard to livestock.

• Note the thorough job of controlling vegetation with "Telvar" around these tanks and pipes. Weeds and grasses can feed fires, make maintenance difficult, and the moisture they hold can cause corrosion. "Telvar" and "Karmex" control unwanted vegetation easily and economically.

Now you can eliminate weeds and grasses that create fire hazards and make maintenance difficult. Just one application of Du Pont "Telvar" monuron or "Karmex" diuron weed killer controls weeds for a season or longer.

"Telvar" and "Karmex" kill weeds through the roots . . . remain in the soil to provide residual action. Easy to handle, economical to use. Be sure to specify "Telvar" or "Karmex" for long-term weed control.

On all chemicals, always follow label instructions and warnings carefully

DU PONT
REG. U. S. PAT. OFF.
BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

TELVAR® monuron · **KARMEX®** diuron

Weed Killers

ATLANTIC CATFORMING is solving refinery puzzles around the world!

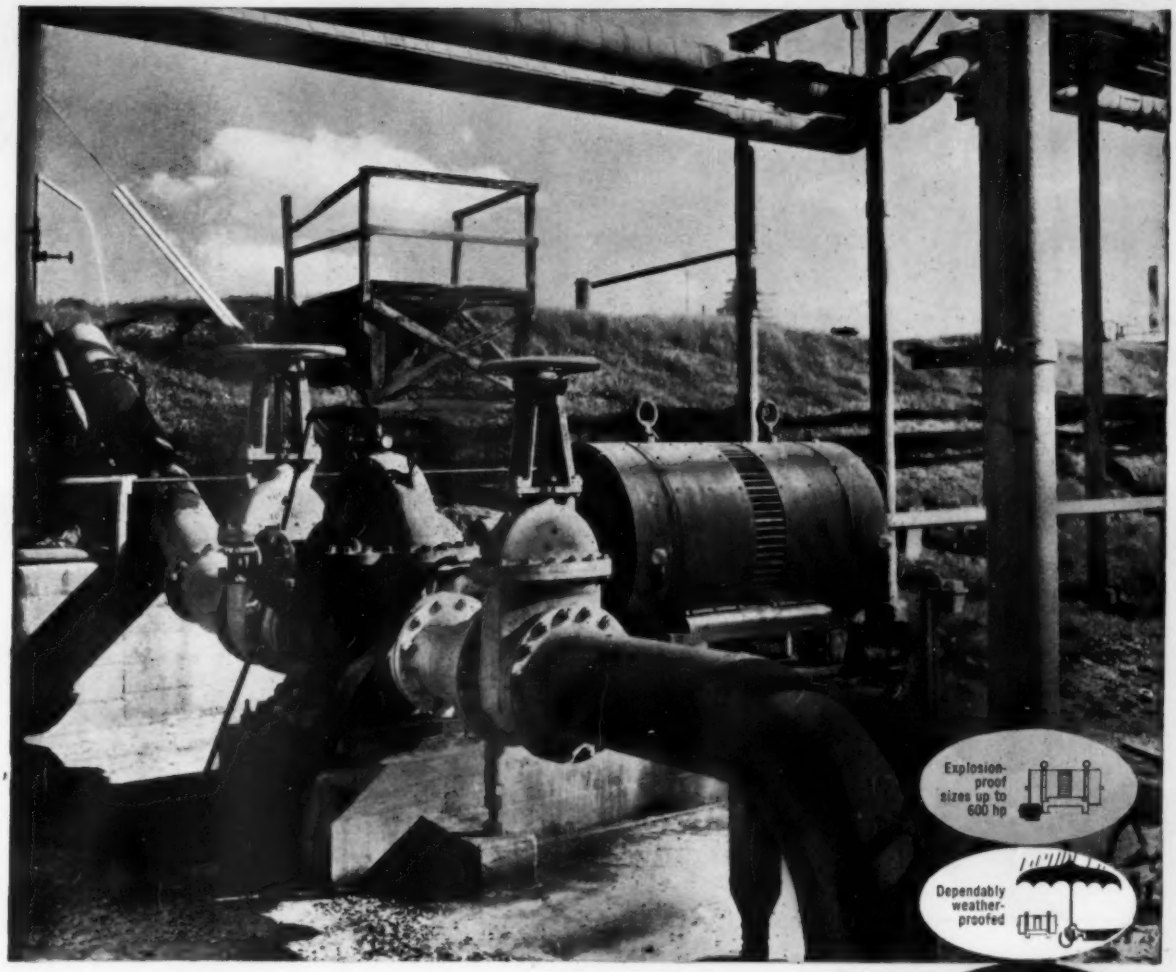
Atlantic's Catforming process is being profitably used in these countries that circle the globe. Naturally, there are important reasons that explain this success. Here they are:

1. **CATALYSTS** Designed for your specific problems.
2. **SELECTIVITY** Achieve superior yields at high octanes.
3. **STABILITY** High activity with long life.
4. **DURABILITY** Tolerance for moisture and nitrogen.
5. **REGENERATION** Extends normal life several times.

For further information on how your plant can use Atlantic Catforming techniques, write or wire The Atlantic Refining Company, P.O. Box 8016 Philadelphia 1, Pennsylvania.

ATLANTIC

it's the CATALYST that counts



A dependable guard for petroleum outposts

Louis Allis explosion-proof motors need little attention

Once installed in your unattended locations, Louis Allis fan-cooled, explosion-proof motors can be virtually forgotten. They're designed to assure long, trouble-free service with a minimum of attention. That's why you'll find them in countless remote installations, like the above 450 hp pump-motor application at a large refinery in the Southwest.

These dependable motors incorporate insulation that resists heat, moisture, and corrosion. What's more, the sturdy completely-enclosed cast-iron housing is perfect protection against rough weather — shrugs off rain or sandstorms with equal ease, and ignores even the corrosive effect of saltwater spray.

Generous bearing sizes and ample provision for lubrication assure minimum maintenance attention and long, trouble-free bearing life.

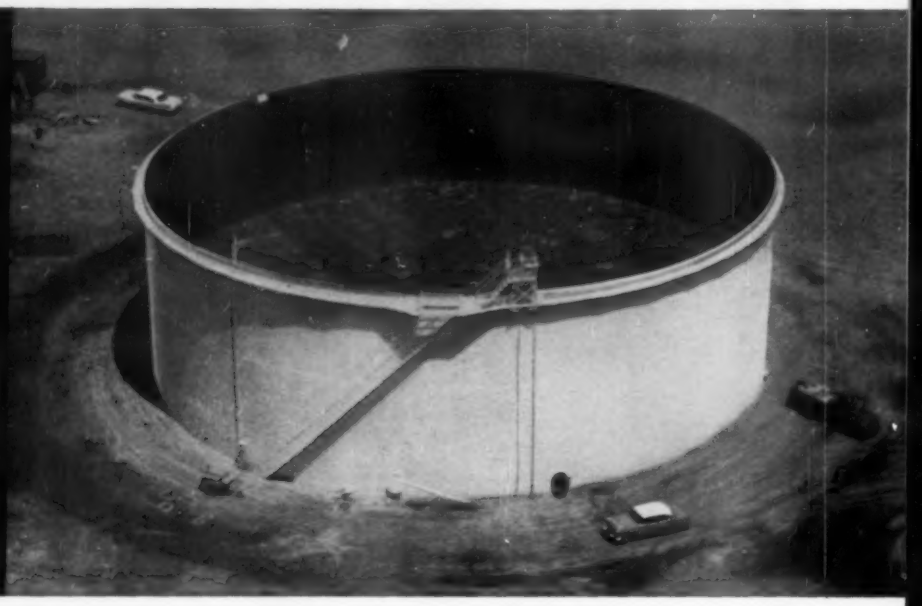
You will like these motors for remote installations. Ask your Louis Allis District Office for Bulletin 800 — or for engineering assistance. Or write The Louis Allis Co., 449 E. Stewart Street, Milwaukee 1, Wis.

LOUIS ALLIS

MANUFACTURER OF ELECTRIC MOTORS AND ADJUSTABLE SPEED DRIVES

AGAIN...EXPERIENCE PAYS OFF HANDSOMELY

9



new double-deck floating roof tanks for TECUMSEH PIPE LINE

The new Hartsdale Station at Schererville, Ind., stores crude on a standby basis for transmission to Cygnet, Ohio, through the 20" Tecumseh Pipe Line. Nine Graver Double-Deck Floating Roof Tanks, with the effective patented Graver Vapor-Stop Seal, were selected to handle a large part of the tremendous storage requirements. The nine Graver tanks will hold 900,000 bbls. of crude. Each is 134' in diameter by 43' high, with a capacity of 100,000 bbls.

Operated by Sinclair Pipe Line Company for itself and co-owners Ashland Oil & Refining Company and The Pure Oil Company, the new storage depot is one of many where Graver floating roof tanks have been installed over the years. Graver's long experience in fabricating and erecting conservation tankage pays off handsomely when Graver Double- or Single-Deck Floating Roof Tanks are specified. Trouble-free operation and long life are understandably inherent in Graver designs.

Plants and Offices Across America

GRAVER®

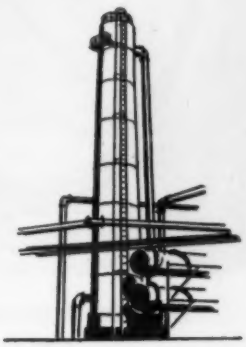
GRAVER TANK & MFG. CO., INC.
EAST CHICAGO, IND.

OAKITE *Maintenance* CLEANING

helps maintenance crews save time, cut costs, keep equipment operating efficiently

Specialized Oakite cleaning, descaling and related materials plus Oakite up-to-date methods are widely used in all branches of the petroleum processing industries. These specialized materials and methods . . . developed through more than 45 years of experience . . . are designed to provide you with the best in all round cleaning efficiency. What is more—all Oakite materials are backed by a binding guarantee. Your interests are fully protected.

Here are four maintenance jobs, typical of the type of many, Oakite is called upon to do every day of the year. These cleaning operations are fully covered in our free booklet "What Petroleum Men Should Know to Simplify Cleaning". Send for a copy.



1 **TOWER CLEANING.** Oakite lists a wide variety of compounds for removing waxes, resinous products, iron sulfides, oxides and other deposits from bubble caps, trays, downcomers. Circulation method eliminates costly manual cleaning.

2 **HEAT EXCHANGERS.** Oakite offers specialized alkaline and acidic type compounds for removing oil, carbon from shell side; lime scale, rust from tube side. Cleaning is done "in-place".

3 **PAINT STRIPPING.** You can strip paint from storage tank exteriors using your own equipment to apply, recover and recirculate stripper. Oakite provides a complete selection of alkaline and solvent strippers.

4 **SALVAGE.** Oakite has simplified methods to make salvage profitable. They give you a choice of specially compounded materials for cleaning and rust-proofing tools, fittings, valves, chains, pumps, etc.

ON-THE-SPOT SERVICE. Whenever you have a ticklish problem of cleaning to solve you can get quick on-the-spot advice by reaching for your phone and calling your local Oakite Technical Representative. His services are available at all times. For full particulars drop a line to Petroleum Service Division of Oakite Products, Inc., 52E Rector Street, New York 6, New York.

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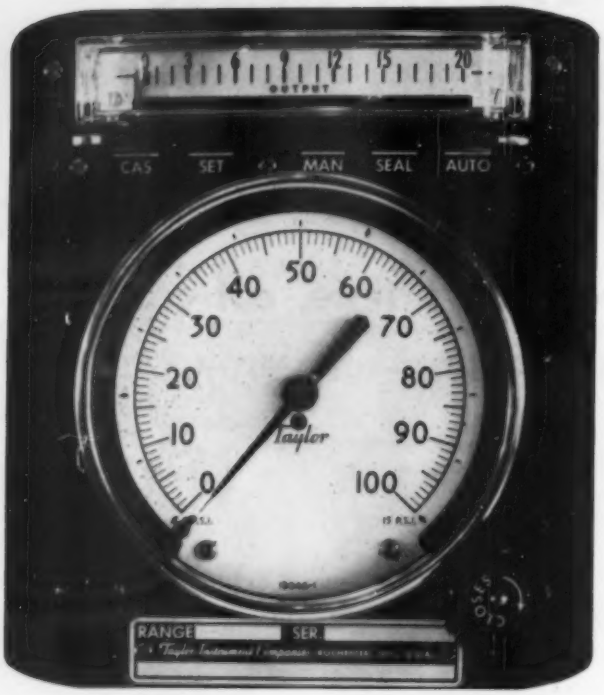
MATERIALS • METHODS • SERVICE

Technical Service Representatives in Principal Cities of U. S. and Canada

OAKITE PRODUCTS, INC.—General Office: 19 Rector St., New York 6, N. Y.

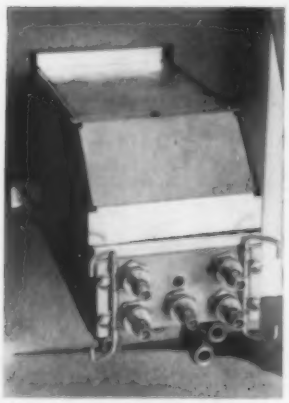
Taylor announces a new low cost

TRANSET* INDICATOR



FOR MOST ECONOMICAL INDICATION AND CONTROL

Team up the new 82KF Series TRANSET Indicator with the SENSAIRE* Temperature Transmitter or the No. 200T Fixed Range Differential Pressure Transmitter.



Rear view, showing plug-in facilities for TRANSCOPE, TRISCOPE or TRANSET Controllers.

Indicator gage snaps in for easy removal without disturbing piping or process control.

This latest addition to the TRANSET family of instruments is designed to permit plug-in mounting of either the bellows type TRANSCOPE*, TRISCOPE* or stacked diaphragm type TRANSET Controllers.

Using accurate, time-proven components, it has exceptionally stable and driftfree set point adjustment. Choice of Bourdon or high accuracy Niafram elements, according to process requirements.

Same cutout as the 66K and 86J TRANSET Indicators and Recorders, and can be quickly adapted to fit the TRANSCOPE Recorder cutout.

Maintenance and servicing is particularly easy. The snap-in indicator gage can be removed for checking without disturbing piping or process control.

Precision adjusting of set point, with regulator having metallic feed-back element and Ni-Span spring, insures stable output even with wide temperature variations.

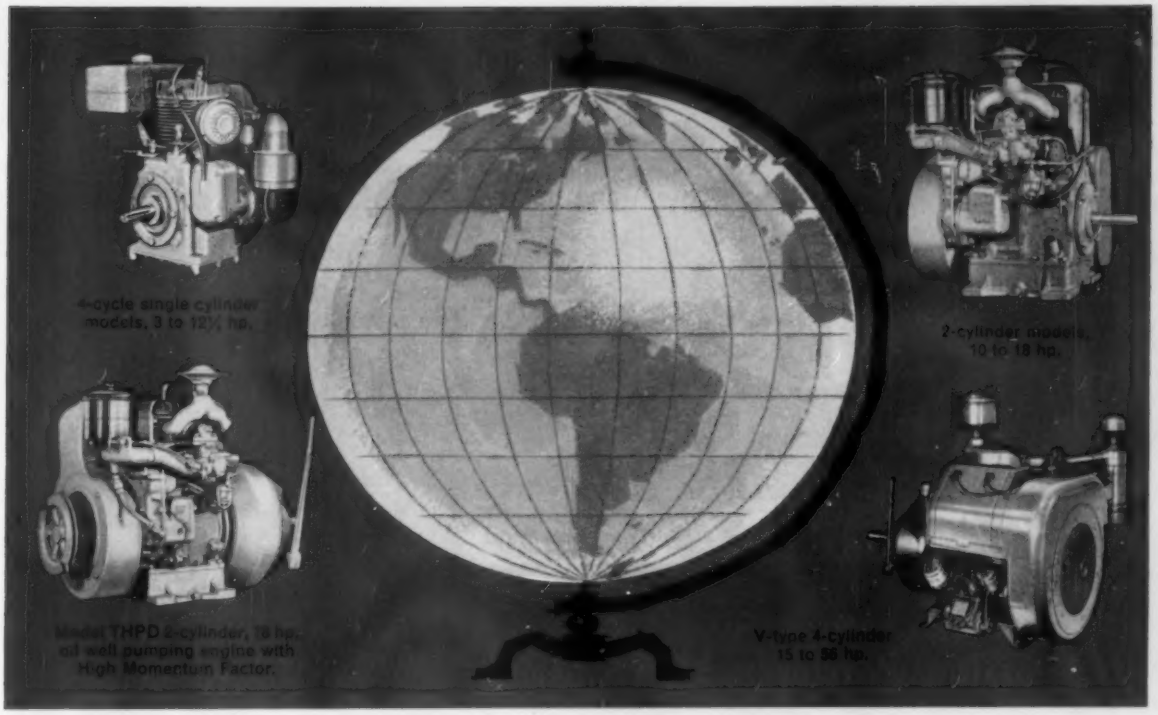
Piston type selector valves with "O"-ring seals give leakless transfer. Positive positioning is assured by lever switching with definite mechanical stops.

Set point transmitter and switching blocks are the same as used in the famous TRANSCOPE Recorder.

For full details of this precision built but inexpensive instrument see your Taylor Field Engineer or write for information to Taylor Instrument Companies, Rochester, New York or Toronto, Ontario.

*Trade-Mark

Taylor Instruments **MEAN ACCURACY FIRST**


4-cycle single cylinder models, 3 to 12½ hp.
2-cylinder models, 10 to 18 hp.
Model THPD 2-cylinder, 18 hp. oil well pumping engine with High Momentum Factor.
V-type 4-cylinder 15 to 56 hp.

SERVICE-PROVED in the oil fields of the world...since 1936

Dating from their oil field baptism in 1936, Wisconsin Engines have won universal recognition as the most practical and versatile power for operating a great variety of oil field utility units.

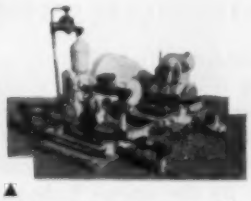
Dead weight, represented by cumbersome, slow-motion engines, preceded the advent of Wisconsin air-cooled power. This has been replaced by light weight, without sacrificing heavy-duty ruggedness and load-lugging, high torque performance.

Working frequently in isolated locations where self-sustaining dependability is a "must," Wisconsin Air-Cooled Engines offer service-proved testimony of long life and low-cost maintenance. Operating records, supported by affidavits, show up to 11,000 hours on-the-job with only minor repairs. Can you match this with any other brand of engine power?

You can't do better than to specify "WISCONSIN" for power service within a 3 to 56 hp. range.

◀ This model THPD Oil Well Pumping Engine has pumped a 2100 ft. well for more than 2½ years with only minor repairs.

▲ Pipeline pumping unit, powered by single cylinder Wisconsin Engine. Capacity: 20 BPH at 500 lbs. pressure. When tank is emptied, pump shuts down automatically.



▲ Wisconsin-powered unit used as a circulating and treating pump. Eliminates re-emulsification of oil and water. Capacity: 30 BPH at 125 lbs. pressure.

◀ Model VF4 Wisconsin 25 hp. Air-Cooled Engine supplies dependable power for deep strata cement pumping on this Halliburton Oil Well Cementing rig.

WISCONSIN MOTOR CORPORATION
Milwaukee 46, Wisconsin
World's Largest Builders of Heavy-Duty Air-Cooled Engines

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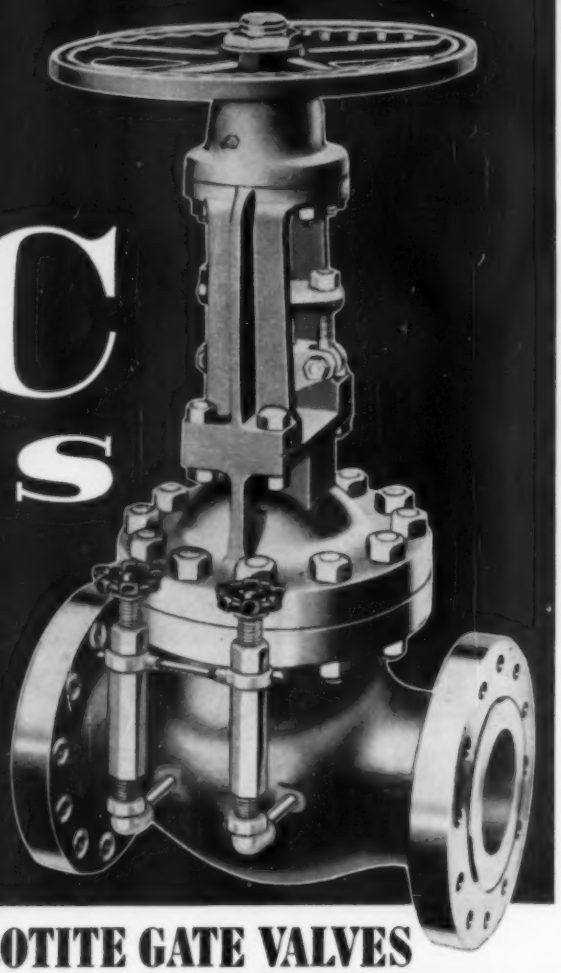
Oil Field Distributors for Wisconsin Engines and all types of Utility Engines

ACCO
for Better
Values

R-P&C VALVES

THE COMPLETE LINE
—DESIGNED FOR DEPENDABILITY



R-P&C "Sure-Tight" LUBROTITE GATE VALVES

—THE MULTI-SERVICE VALVES LUBRICATED THROUGH THE SEAT RINGS

Lubrotite Gate Valves—created and patented by R-P&C—are built to provide absolute tightness and long, trouble-free service in handling all fluids for which iron and cast steel valves are serviceable.

By the unique Lubrotite system, in which each seat ring is served by a Lubrotite gun, a lubricant seal is forced through to the valve's seating surface. This lubricant prevents leakage, retards corrosion, prevents sticking, reduces wear on seating surfaces and makes for easier operation. Net result: reduced operating, maintenance and over-all valve costs!

Available in cast steel and iron types. A wide variety of lubricant seals, each suitable for numerous services, can be furnished.

Lubrotite Gate Valves are giving highly successful service in handling—

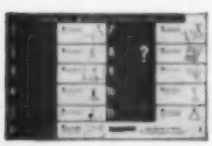
Gasoline...Oil...Benzol...HF Alkylation...
other Petroleum Derivatives —

Natural and Artificial Gas...Air...
Helium Gas...Coke and Gas...Water —

Vacuum Service (evaporation, etc.)...
Feed Water Lines and Steam Plants —

Mine and Acid River Waters...
Certain Chemicals...Other Services

Lubrotite Gate Valves form a part of the complete R-P&C line, which includes gate, globe, angle and check valves in all standard materials; all in a wide range of sizes, styles and pressure classes. Order through nearby R-P&C Distributor. Write our Reading office for catalog.



FREE WALL CHART
"How to Protect Your Valves"
Installation pointers, operating tips, clues to longer valve life. They are all on this 22" x 17" wall chart. Write for your free copy.

R-P&C VALVE DIVISION
AMERICAN CHAIN & CABLE

Reading, Pa., Atlanta, Boston, Chicago, Denver, Detroit, Houston, New York, Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

ACCO

Humble Coatings Give You Three-Way Reduction in Maintenance Costs!

Humble coatings last six months to a year longer than most other paints. You save *two* ways — on paint and labor. The *third*, and most important, way you save is this: you get better protection, which means longer life for expensive equipment.

Humble coatings contain rust-preventing ingredients that not only provide surface protection, but also neutralize any corrosive elements that may penetrate the surface protection and attack the metal. These coatings were specially developed to give maximum protection in refineries and chemical plants where strong acids, alkalis and salt sprays produce severe corrosive conditions.

Without cost or obligation, one of Humble's trained engineers will make a thorough study of your needs and recommend a complete painting program for you. Call your nearest Humble representative, or phone or write:

HUMBLE OIL & REFINING COMPANY
Consumer Sales, P.O. Box 2180,
Houston 1, Texas

Humble's line of coatings includes —

- RUST-BAN ®
- Vinyls
- Epoxies
- Acrylics
- Phenolics
- Enamels
- Tank coatings
- Hot surface coatings
- Interior and exterior emulsion-type paints

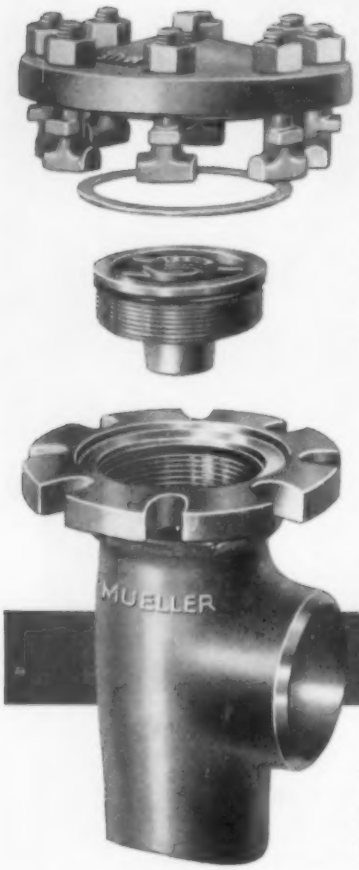
HUMBLE

MUELLER®

"NO-BLO® tee gives fast, safe tie-in"

Tie into steel lines under pressure—without interrupting flow or losing fluid — with the Mueller Flanged Tee. Forged-steel tee has similar analysis to pipe line, assuring easy weldability on inlet and outlet. 150, 300, 400 and 600-pound flanges withstand operating pressures up to 1200 p.s.i. Tee can be installed under operating pressures up to 500 p.s.i. at 100° Fahrenheit or 250 p.s.i. at 500° Fahrenheit with the Mueller power-operated C-1 Drilling Machine.

Cut into the line is made through the tee with Mueller equipment. Completion plug with "O" ring seal is inserted into tee through a gate valve to provide positive seal against leakage. Completion plug has internal equalizing valve which balances pressure on both sides of plug, assuring easy insertion into, or extraction from the tee while under pressure.



H-17505 Flanged Tee.
230 p.s.i. working pressure
at 100°F.
Sizes 3", 4", 6", 8".

NO-BLO®

Write for complete information. A complete line of Mueller NO-BLO® products is available for making stop-offs, running temporary lines and making tie-ins under pressure.

MUELLER CO. **DECATUR, ILL.**

Factories at: Decatur, Chattanooga, Los Angeles,
In Canada: Mueller, Limited, Sarnia, Ontario

Since 1857

MOST IMPORTANT ADVANCES IN PUMP DESIGN IN 30 YEARS!

WHELAND *PLANETARY* HP-16000 SLUSH PUMP

DUPLEX POWER SLUSH PUMP 7¾" x 16"

600 HP at 65 RPM

U. S. Patent 2,649,988 and 2,717,186. Other patents pending.

NOW! **FOR THE FIRST TIME . . .**

these proven mechanical principles are applied to a slush pump!

SEE OUR EXHIBIT

MAY 14-23. 1959
Tulsa, Oklahoma

- **PLANETARY GEAR SYSTEM** with gear cartridge assembled and inserted as a unit.
- **CROSSHEAD IS A PERFECT CIRCLE** thus stays perfectly aligned in every direction.
- **FLOATING INPUT SHAFT** with unique sheave mounting which lets shaft transmit torque load ONLY.

Three years in designing, developing and in final field testing are behind this newest, most advanced WHELAND 16" PUMP. A folder giving the highlights of this new pump is yours for the asking . . . or we can give you current locations so you can see it in operation. You can't afford to buy any pump in this size until you've seen this new Wheland pump!

WHELAND

ROTARY DRILLING MACHINERY

THE WHELAND COMPANY

CHATTANOOGA, TENNESSEE, U.S.A.

DRAW WORKS • SLUSH PUMPS • ROTARIES
CROWN BLOCKS • TRAVELING BLOCKS • SWIVELS

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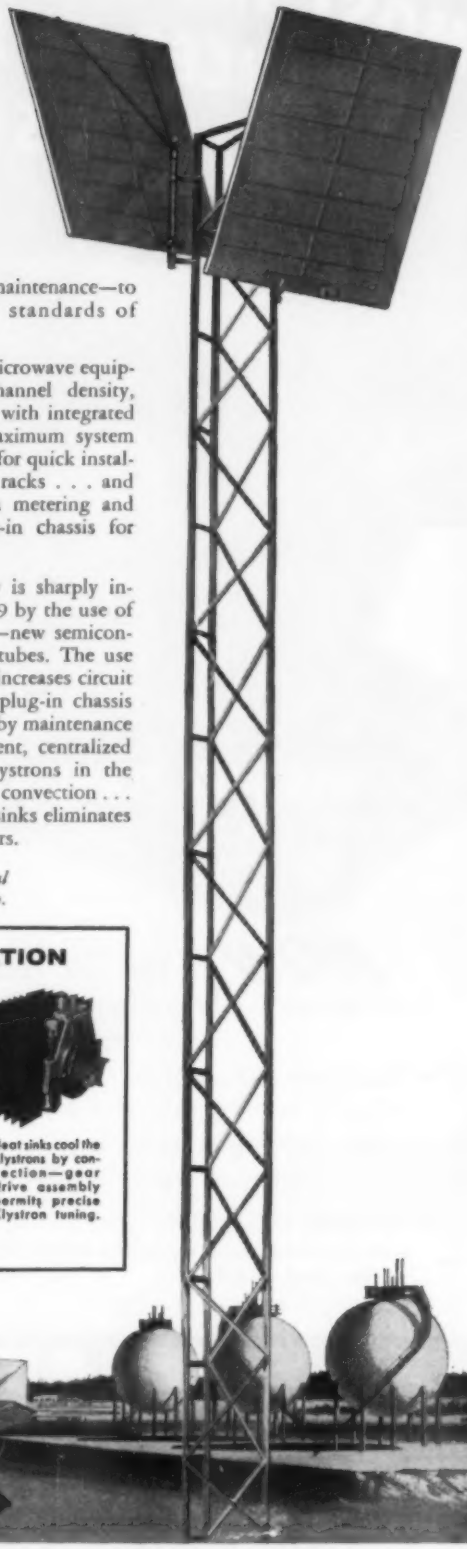
EXPORT DISTRIBUTORS: LUCEY EXPORT CORPORATION—233 Broadway, New York 7, New York—Broad Street House, London, E. C. 2, England.

Reliable, unattended microwave operation for pipeline communications and control!



PLUS PHILCO'S TURNKEY SERVICES

Philco CLR-9 microwave delivers outstanding system reliability, economy of installation and operation, simplified equipment maintenance for dependable pipeline communications. With 240 voice channel baseband capacity—for telephone, telemetering and remote control—and capability for handling high-speed computer data transmission—Philco microwave fills both immediate and long-range requirements of modern pipeliners.

Philco's complete turnkey service includes—*site surveys* by competent survey engineers experienced in field techniques; *system planning* by Philco's systems engineers who design your complete communications system; *installation* of your microwave system by Philco field engineers—including erection of towers and shelters; and, Philco field engineers are available for *field service*—periodic inspection and preventive maintenance—to maintain the highest standards of system performance.

Philco's new CLR-9 microwave equipment provides high channel density, duplex communications with integrated standby facilities for maximum system reliability. It is designed for quick installation in standard relay racks . . . and engineered with built-in metering and test facilities plus plug-in chassis for easy field maintenance.

Performance reliability is sharply increased in the new CLR-9 by the use of tubeless power supplies—new semiconductor rectifiers replace tubes. The use of printed wiring panels increases circuit stability—and complete plug-in chassis may be quickly removed by maintenance personnel (permits efficient, centralized depot maintenance). Klystrons in the new CLR-9 are cooled by convection . . . the use of compact heat sinks eliminates the need for bulky blowers.

At Philco, opportunities are unlimited in electronic and mechanical research and engineering • Look ahead . . . and you'll choose Philco.

NEW PHILCO CLR-9 MICROWAVE STATION

The CLR-9 terminal consists of wave-guide assemblies, master control, tubeless power supplies and plug-in chassis for IF assembly, baseband drop, modulator, reflector control and servo.
Rugged printed wiring panels increase circuit stability and simplify maintenance.
Heavy-duty, tubeless power supplies increase reliability by employing semiconductor rectifiers—assures maximum reliability and minimum maintenance.
Heat sinks cool the Klystrons by convection—gear drive assembly permits precise Klystron tuning.

PHILCO

Government & Industrial Division

4716 Wissahickon Ave., Philadelphia 44, Pa.

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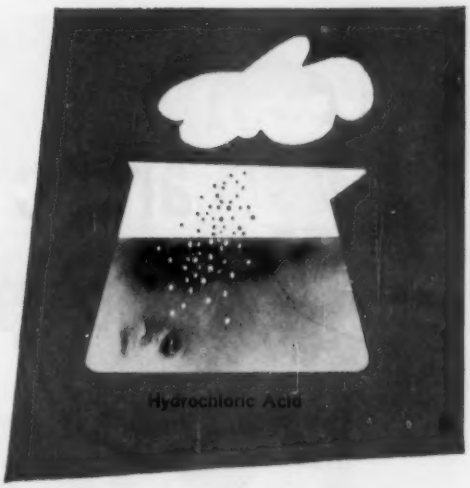
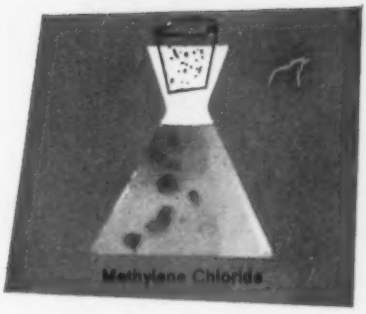
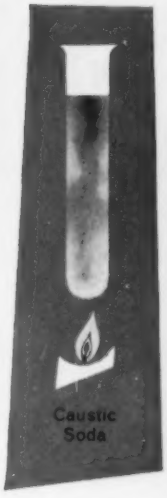
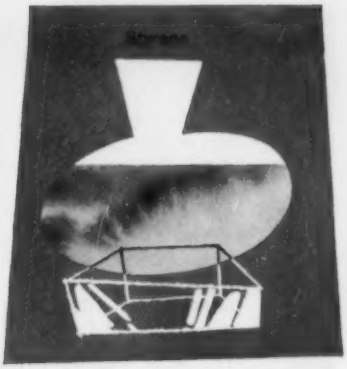
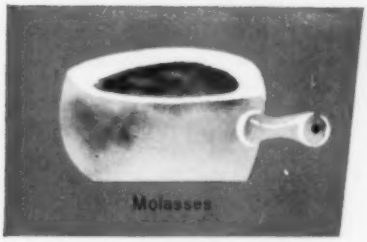
which of these
<u>can't</u> be stored in a
GENERAL AMERICAN TERMINAL?









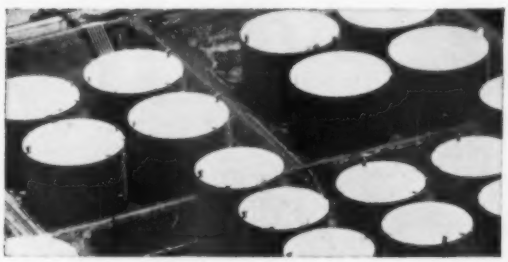


<u>answer</u>! General American <u>can</u> store them all! (and does!)

Six "problem" products! Yet each can be stored safely and economically at General American Tank Storage Terminals.

Whether your product is as volatile as methylene chloride, as corrosive as caustic soda or as viscous as molasses, General American can supply the storage facilities for your needs.

General American Tank Storage Terminals offer you the privacy, safety, service and flexibility of your own terminal—*without capital investment on your part.* Write or phone—today. You'll find... *it pays to plan with General American.*



Six terminals at 5 key-market locations with over 14,000,000 barrels capacity: PORT OF NEW YORK (Carteret, N.J.), PORT OF NEW ORLEANS (Good Hope, La.), CHICAGO, ILLINOIS (Bedford Park), PORT OF HOUSTON (Galena Park and Pasadena), CORPUS CHRISTI, TEXAS.

GENERAL AMERICAN TANK STORAGE TERMINALS

a division of GENERAL AMERICAN TRANSPORTATION CORP. *135 South La Salle Street • Chicago 90, Illinois*

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POWELL

has the right valve!

Handling fluids at sub-zero temperatures or at super-heat – or any of the temperatures in between – is no problem if you install Powell valves. There is a Powell Dependable Valve to meet your most exacting flow-control requirements, no matter what the extremes of your needs.

The complete Powell line includes all types of valves in bronze, iron, steel and corrosion resistant metals and alloys, for pressures from 125 to more than 2500 pounds W.P. Consult your local distributor (there's one in most major cities) or write to:

The Wm. Powell Company • Cincinnati 22, Ohio

Dependable Valves Since 1846

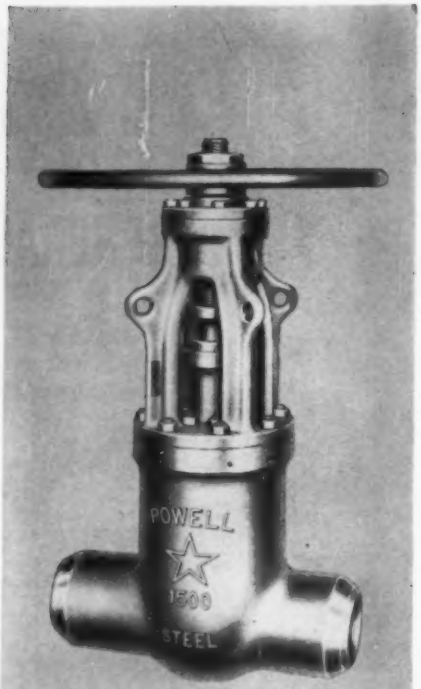

Fig. 11303 W. E.: Steel O. S. & Y. pressure seal gate valve for 1500 pounds W. P. at high temperatures. Powell pressure seal valves are available for working pressures from 600 through 2500 pounds.

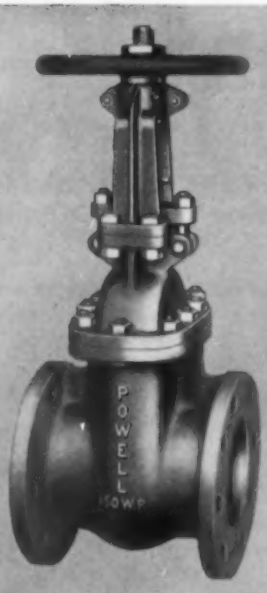

Fig. 86190: Steel union bonnet globe valve for 400 W.O.G. Designed for liquified petroleum gas service.

Fig. 2453G: Large 150 pound stainless steel O. S. & Y. gate valve for low temperature service. Can be furnished with interchangeable solid or double wedge disc.

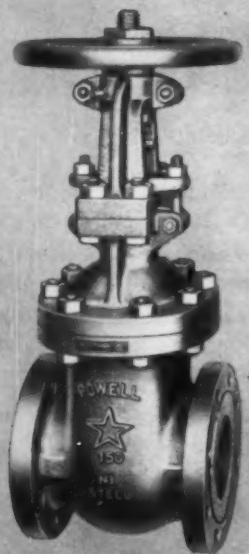

Fig. 1503 Mod.: 3½% Nickel-steel O. S. & Y. gate valve for low temperature service.

POWELL...world's largest family of valves

CONTINENTAL RED SEALS *"Stand Up and Take It"* ON THE TOUGHEST OIL FIELD JOBS

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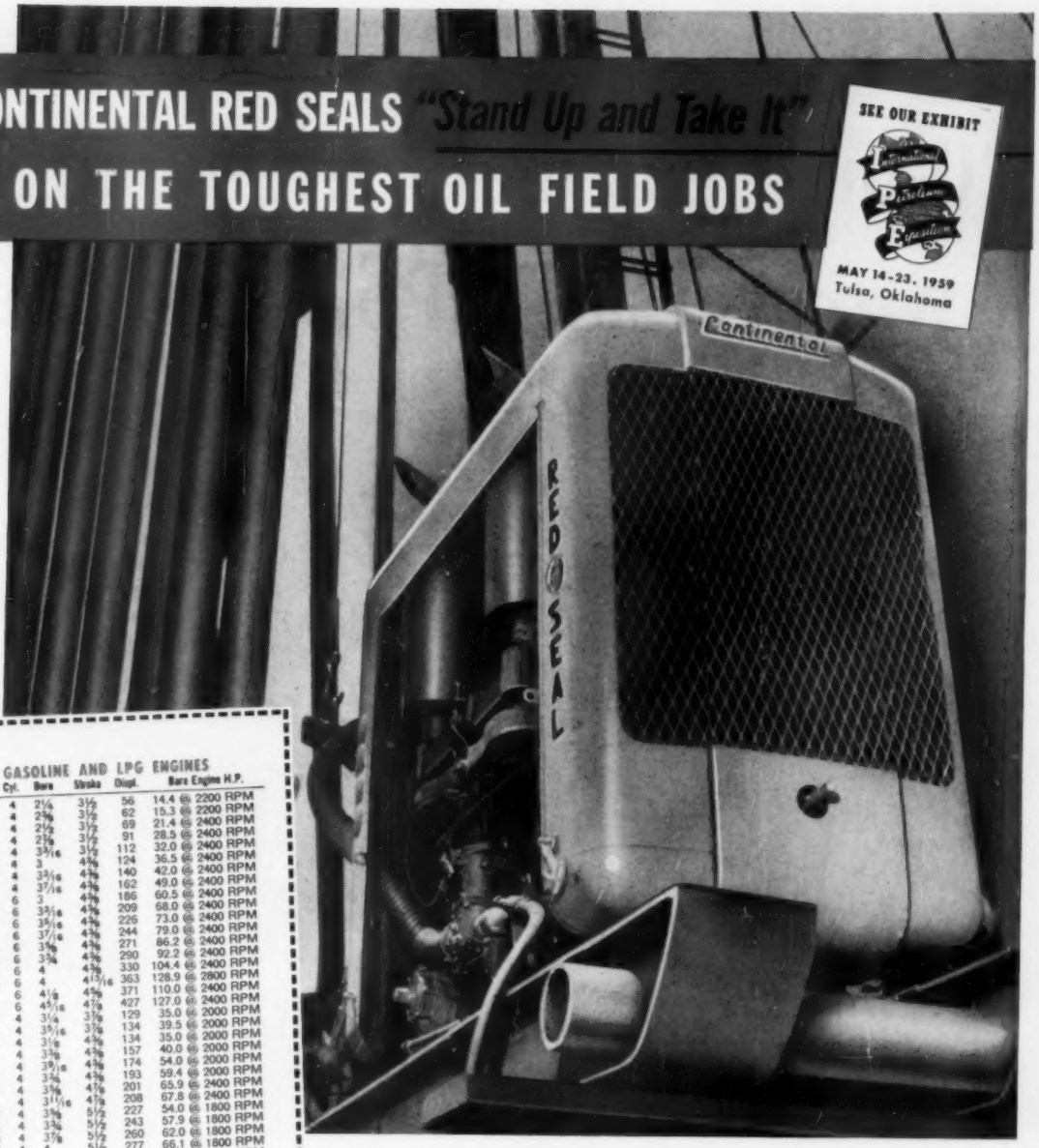
International Petroleum Exposition
MAY 14-23, 1959
Tulsa, Oklahoma



GASOLINE AND LPG ENGINES

Model	Cyl.	Bore	Stroke	Displ.	Bare Engine H.P.
N56	4	2 1/16	3 1/2	56	14.4 @ 2200 RPM
N62	4	2 3/16	3 1/2	62	15.3 @ 2200 RPM
Y69	4	2 1/2	3 1/2	69	21.4 @ 2400 RPM
Y91	4	2 7/8	3 1/2	91	28.5 @ 2400 RPM
Y112	4	3 3/16	3 1/2	112	32.0 @ 2400 RPM
F124	4	3	4 3/8	124	36.5 @ 2400 RPM
F140	4	3 3/16	4 3/8	140	42.0 @ 2400 RPM
F162	4	3 7/16	4 3/8	162	49.0 @ 2400 RPM
F186	6	3	4 3/8	186	60.5 @ 2400 RPM
F209	6	3 3/16	4 3/8	209	68.0 @ 2400 RPM
F226	6	3 5/16	4 3/8	226	73.0 @ 2400 RPM
F244	6	3 7/16	4 3/8	244	79.0 @ 2400 RPM
M271	6	3 5/8	4 3/8	271	86.2 @ 2400 RPM
M290	6	3 3/4	4 3/8	290	92.2 @ 2400 RPM
M330	6	4	4 3/8	330	104.4 @ 2400 RPM
M363	6	4	4 13/16	363	128.9 @ 2800 RPM
B371	6	4 1/8	4 5/8	371	110.0 @ 2400 RPM
B427	6	4 5/16	4 7/8	427	127.0 @ 2400 RPM
*Z129	4	3 1/4	3 7/8	129	35.0 @ 2000 RPM
*Z134	4	3 5/16	3 7/8	134	39.5 @ 2000 RPM
G134	4	3 1/8	4 3/8	134	35.0 @ 2000 RPM
G157	4	3 3/8	4 3/8	157	40.0 @ 2000 RPM
*G174	4	3 9/16	4 3/8	174	54.0 @ 2000 RPM
*G193	4	3 3/4	4 3/8	193	59.4 @ 2000 RPM
*E201	4	3 5/8	4 7/8	201	65.9 @ 2400 RPM
*E208	4	3 11/16	4 7/8	208	67.8 @ 2400 RPM
H227	4	3 5/8	5 1/2	227	54.0 @ 1800 RPM
H243	4	3 3/4	5 1/2	243	57.9 @ 1800 RPM
*H260	4	3 7/8	5 1/2	260	62.0 @ 1800 RPM
*H277	4	4	5 1/2	277	66.1 @ 1800 RPM
K363	6	4	4 13/16	363	123.0 @ 2400 RPM
*J382	4	4 1/2	6	382	74.0 @ 1400 RPM
*U403	4	4 5/8	6	403	110.0 @ 2000 RPM
T371	6	4 1/8	4 5/8	371	119.0 @ 2400 RPM
T427	6	4 5/16	4 7/8	427	140.0 @ 2400 RPM
U501	6	4 1/2	5 1/4	501	160.0 @ 2400 RPM
R513	6	4 1/2	5 3/8	513	164.3 @ 2400 RPM
R572	6	4 3/4	5 3/8	572	182.4 @ 2400 RPM
R602	6	4 7/8	5 3/8	602	191.7 @ 2400 RPM
V603	8	4 3/4	4 1/2	603	240.0 @ 2800 RPM
S749	6	5 3/8	5 1/2	749	217.0 @ 2200 RPM
S820	6	5 7/8	5 1/2	820	237.0 @ 2200 RPM

CUSHIONED POWER DIESEL ENGINES

Model	Cyl.	Bore	Stroke	Displ.	Bare Engine H.P.
*ZD129	4	3 1/4	3 7/8	129	34.0 @ 2000 RPM
GD157	4	3 3/8	4 3/8	157	39.0 @ 2000 RPM
*GD174	4	3 9/16	4 3/8	174	42.5 @ 2000 RPM
*GD193	4	3 3/4	4 3/8	193	55.5 @ 2200 RPM
*ED201	4	3 5/8	4 7/8	201	45.8 @ 2000 RPM
*ED208	4	3 11/16	4 7/8	208	61.5 @ 2200 RPM
HD243	4	3 3/4	5 1/2	243	68.9 @ 2200 RPM
*HD260	4	3 7/8	5 1/2	260	74.0 @ 2400 RPM
*HD277	4	4	5 1/2	277	79.0 @ 2400 RPM
*JD382	4	4 1/2	6	382	87.4 @ 2000 RPM
*UD403	4	4 5/8	6	403	91.5 @ 2000 RPM
TD427	6	4 5/16	4 7/8	427	132.0 @ 2200 RPM
RD572	6	4 3/4	5 3/8	572	154.0 @ 2000 RPM
VD603	8	4 3/4	4 1/2	603	197.0 @ 2600 RPM
SD802	6	5 9/16	5 1/2	802	202.0 @ 1800 RPM

*Available for industrial applications only.

No matter what the exact requirement of the job, there's a Continental Red Seal model engineered and built to meet it down to the last detail. The industrial engine power range is a broad one, with models at closely-spaced levels—14 to 240 horsepower—and they're available for operation on all standard fuels. Each is the product of more than 56 years' engine-building experience—each with the in-built stamina to "stand up and take it" on the toughest oil field jobs year after year—and each backed by parts and service facilities that reach around the world.

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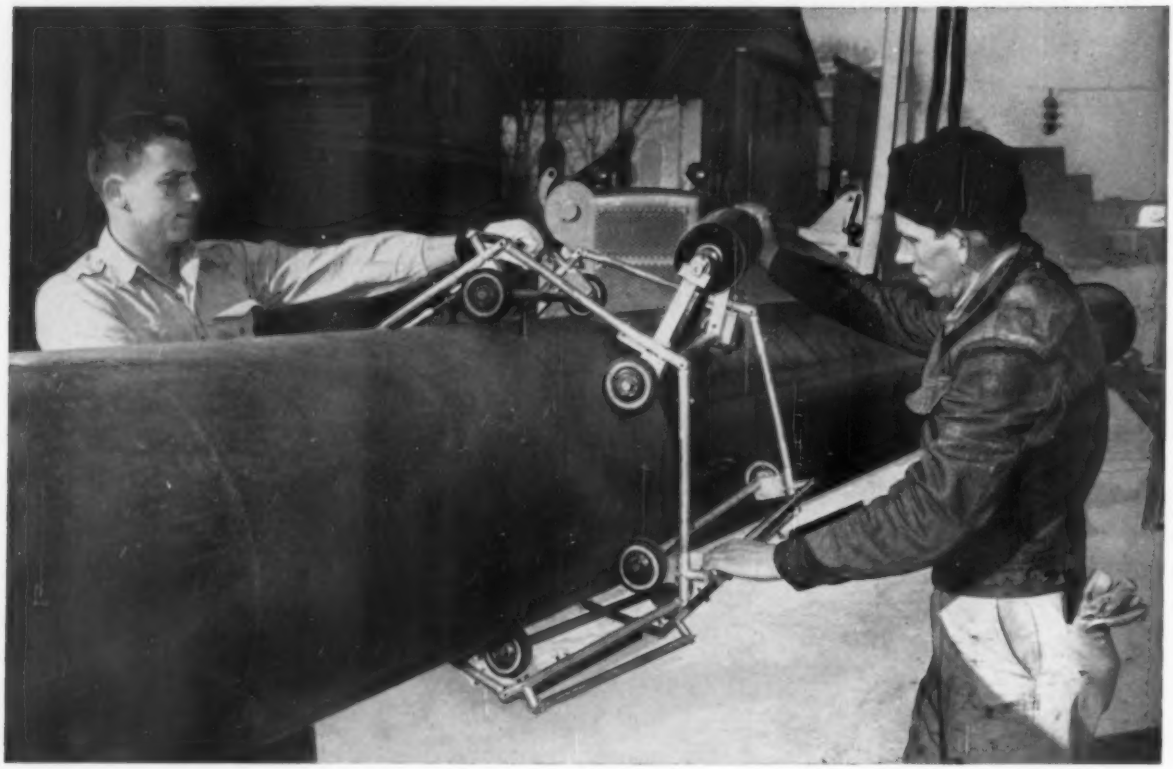
6218 CEDAR SPRINGS ROAD, DALLAS 9, TEXAS • 1252 OAKLEIGH DR., EAST POINT (ATLANTA) GA.

Continental Motors Corporation
MUSKEGON • MICHIGAN

THE MODERN TAPE...AT WORK FOR MODERN INDUSTRY

20-inch gas main site-wrapped with versatile Polyken® tape



Upper New York State utility company turns to Polyken tape to get the job done fast...and sure...in congested areas

This is the tape that's making big-inch pipeline news this year. Made of tough, inert polyethylene, Polyken tape offers proven protection against the corrosive effects of moisture, soil chemicals and electrolytic current.

And here, on a site-wrapping job in a congested city area, it provides another major advantage: *simplicity of application.*

Tape saves headaches

You know the complications of using a hot coating in a place like this. Easy-to-apply Polyken tape does away with these problems. It goes on, as you see, right off the roll—without heat, liquids, solvents or thinners. Saves time, labor and equipment costs.

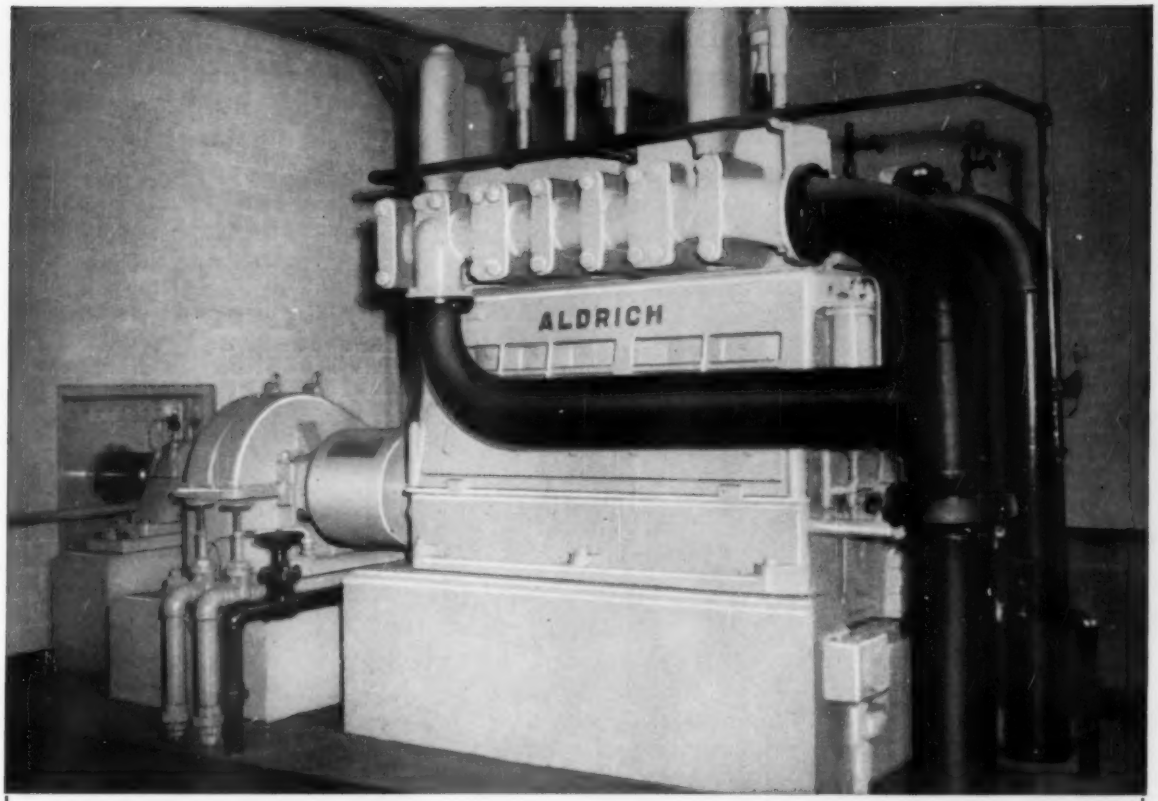
Now you know why more and more utility companies are turning to site or over-the-ditch wrapping for their distribution lines with time-tested, time- and money-saving Polyken tape.

For further information, write to the Polyken Sales Division, 309 W. Jackson Blvd., Chicago 6, Ill.

Polyken®

Experienced in modern PROTECTIVE COATINGS

THE KENDALL COMPANY
Polyken Sales Division



FIELD REPORT

APPLICATION: Pipeline Service

South Saskatchewan Pipe Line Company, Cantuar, Saskatchewan.

PUMPS: 3 Aldrich Quintuplex,

4½" plungers, 6" stroke. Each having a capacity of 20,000 b/d at 300 RPM, 1200 pounds pressure.

OPERATION STARTED: December, 1955

EXPERIENCE TO DATE:

Units pump viscous crude oil over 158 miles of 16" main line pipe. Customer reports exceptionally fine field service with routine maintenance only.

Field parts stock available in Carmi, Ill.; Charleston, W. Va.; Casper, Wyo.; Houston; Los Angeles; Odessa and Tulsa. For further information, write the Aldrich Pump Company, 3 Gordon Street, Allentown, Pa.

the toughest pumping problems go to ALDRICH

ALLEN-BRADLEY | Cutting Costs in the Chemical Industry

Photo Courtesy of Texas Butadiene & Chemical Co.

Bulletin 709 Size 1 Solenoid Starter in NEMA Type 4 watertight enclosure

This Motor Starter is built to be forgotten!

Even routine inspection is kept to an absolute minimum with Allen-Bradley motor starters . . . an especially important saving when your installation requires bolted covers, as used with watertight and explosion-proof enclosures.

It's the simple contact mechanism—with only ONE moving part—that enables Allen-Bradley solenoid starters to operate over long periods without attention. With no bearings to corrode or stick . . . no flexible jumpers to break . . . you are assured *millions* of trouble free operations. In addition, there are double break, silver alloy contacts that never need servicing of any kind. And permanently accurate thermal overload relays protect motors against burnout, irrespective of time or atmospheric conditions.

Specify Allen-Bradley quality controls for *all* your installations . . . and you'll save on maintenance.

NEMA 9 For Hazardous Dust

NEMA 7 For Hazardous Gas Locations

NEMA 8 For Corrosive Hazardous Gas

NEMA 11 Corrosion-proof

Allen-Bradley Bulletin 709 across-the-line solenoid starters are made in eight sizes with maximum ratings to 300 hp, 220 volts; 600 hp, 440-550 volts.

ALLEN-BRADLEY CO.
MOTOR CONTROL
QUALITY

Allen-Bradley Co., 1304 S. Second St. Milwaukee 4, Wis.

In Canada: Allen-Bradley Canada Ltd. Galt, Ont.

12345 67890

S&J High Speed Telepulse–
Error-Free Remote Reading:
Level-Temperature-Pressure

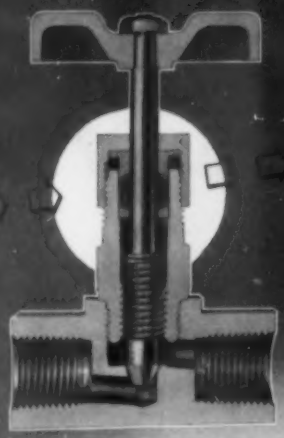
New S & J High Speed Telepulse gives remote readings in English, decimal or metric systems. Only 12 seconds for *complete* gaging cycle, including automatic selection confirmation of user's tank numbers. Other process variables transmitted with similar accuracy and speed. New Error Check circuit makes S & J Telepulse immune to error from equipment malfunction or transmission line failure. Remote control of motors and valves also possible for reporting "on," "off," "open," "closed" conditions. Building-block design provides flexibility for expansion. Plug-in construction and high-reliability components simplify maintenance. 100% digital S & J High Speed Telepulse readily adapted to datalogging and automatic data processing. Write for descriptive technical bulletins.

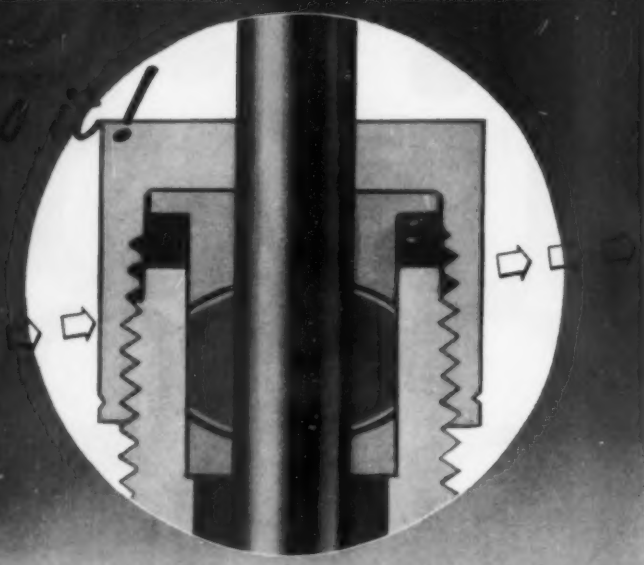
SHAND AND JURS COMPANY
2600 EIGHTH STREET • BERKELEY, CALIFORNIA

SHAND AND JURS | GPE GENERAL PRECISION EQUIPMENT CORPORATION

Branch Offices and Representatives in Principal Cities • A subsidiary of General Precision Equipment Corporation

Marsh has it!





The Marpak Packing System

—now with fabulous

"TEFLON" PACKING

An outstanding feature of the Marsh Needle Valve has been the Marpak Packing System. This unique method of obtaining a tight, but non-binding seal is one of the important reasons for the ability of Marsh Valves to give precision regulation at any pressure up to 10,000 psi.

Now the Marpak system has been made still better by the use of today's miracle material—"Teflon." You probably know of the almost incredible toughness, resilience and non-adhesive properties of Teflon—properties that are unimpaired by the most powerful of solvents, acids, or alkalies, even at temperatures up to 500° F.! As a result of incorporating "Teflon" packing, Marsh Stainless Steel Needle Valves are now

Guaranteed for any pressure up to 10,000 psi at any temperature up to 500° F.

In other makes of valves permissable temperature *decreases* as pressure *increases*—but not with Marsh.

Teflon packing is one more addition to the list of features that are combined only in Marsh Stainless Steel Needle Throttling Valves. Note the list opposite...ask for bulletin.

Available in

MARSH

416 Stainless Steel

Needle Throttling Valves

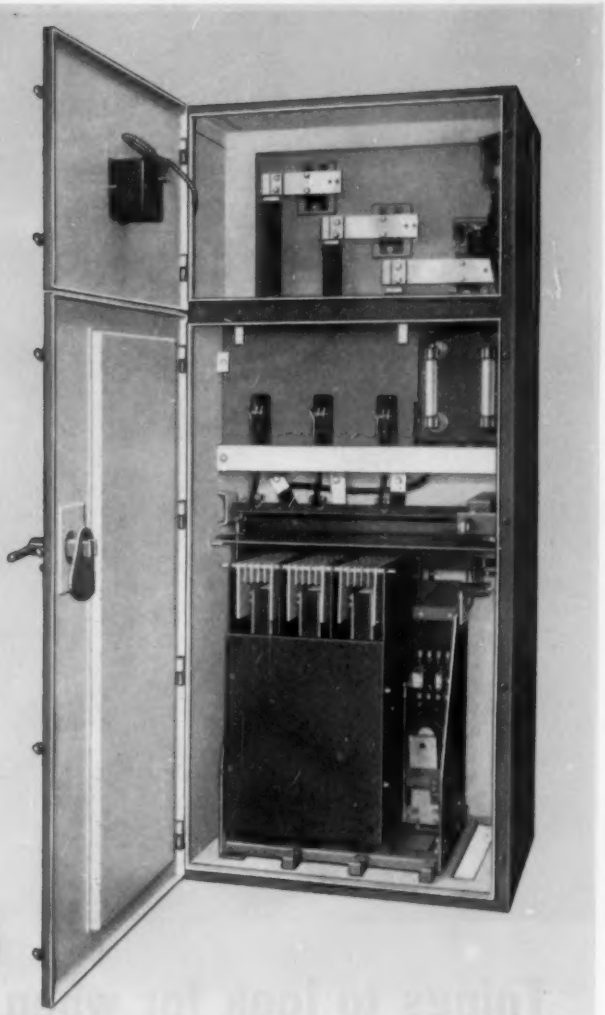
- **Body and stem guide machined from bar stainless steel stock**
- **Valve Stem hardened stainless**
- **Fine stem threads for extra strength and precision throttling**
- **Deeper inlet and outlet chambers**
- **Bodies made in accordance with MSS regulations**
- **Packing "Marpak" system incorporating "Teflon" as described opposite**

MARSH INSTRUMENT CO. *Sales Affiliate of Jas. P. Marsh Corp.*, **Dept. L Skokie, Ill.**
Marsh Instrument and Valve Co. (Canada) Ltd., 8407 103rd St., Edmonton, Alberta
Houston Branch Plant: 1121 Rothwell St., Sect. 15, Houston, Texas

NEW EC&M STARTER

GIVES

100/150 MVA fault protection



WITHOUT

FUSES!

Proven by tests conducted by an independent testing station, EC&M's new "fuseless" ZHA air-break starter has a certified interrupting capacity of 100,000 KVA at 2400 volts, 150,000 KVA at 4800 volts. This starter is simpler and much more accessible for inspection and checking connections.

The ZHA starter is not subject to problems associated with fuses. Single phasing due to blown fuses is eliminated...no costly replacement fuses to stock.

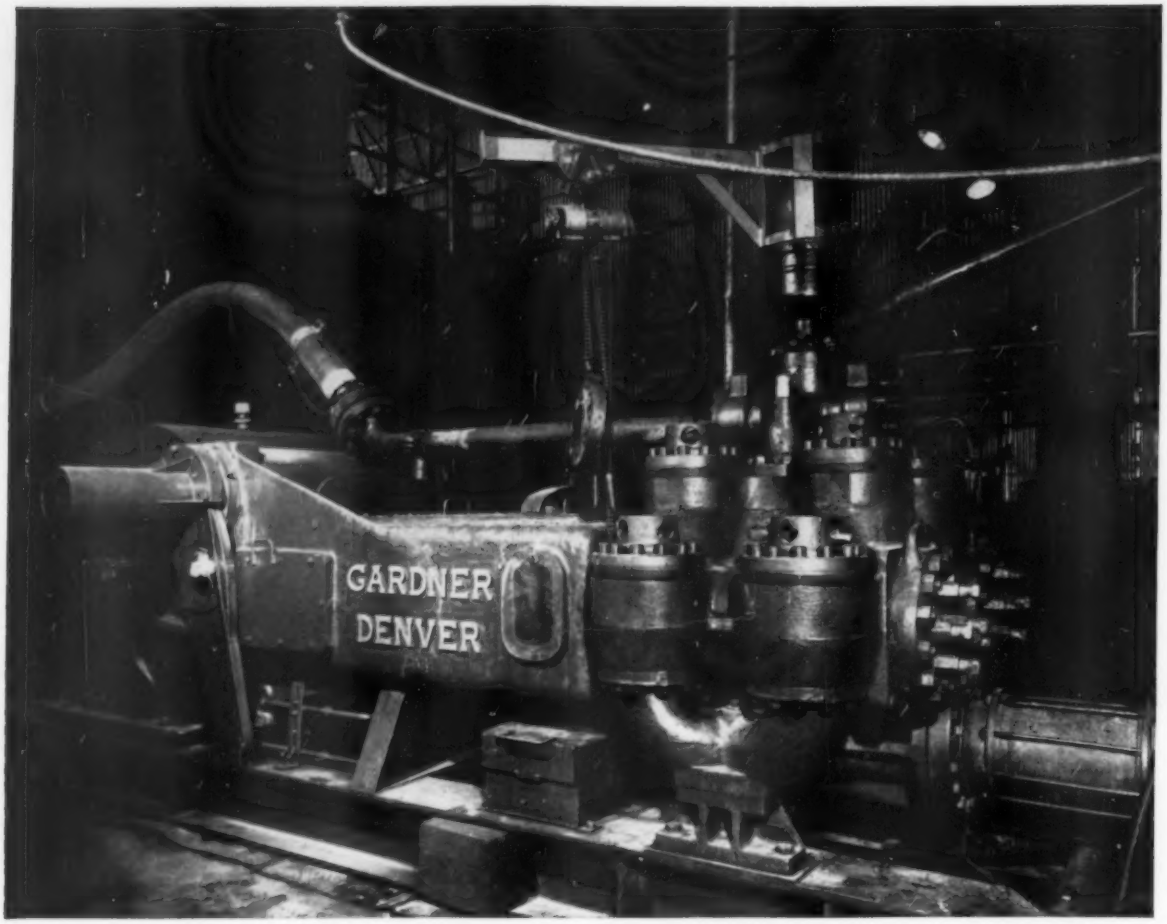
For positive personnel safety, the ZHA is equipped with a 3-way doorlatch, interlocked between disconnect switch and contactor interlocking system. The disconnect switch is gang-operated. When the door is open, disconnect blades are *visible* in the open and grounded position.

No roll-out needed...phase barrier and arc-chutes draw out horizontally, making front and rear contact tips readily accessible. Bus bars are used for power connections throughout the starter. Redesigned arc-chutes and interphase barrier, and improved contactor are additional features which make the ZHA starter your logical choice for high-voltage motor drives.

***GET THE COMPLETE STORY** on certified fuseless fault protection for high-voltage motor drives. Write for Bulletin 8130*

THE ELECTRIC CONTROLLER & MFG. CO.
A DIVISION OF THE SQUARE D COMPANY
CLEVELAND 28 • OHIO

2320



Things to look for when choosing a mud pump

- Rigid main frame—to keep parts in alignment and withstand heavy-duty loads.
- Eccentric construction—for smooth operation and extra resistance to high plunger loads.
- Large-diameter bronze bearings—reduce unit bearing loads, cushion shock loads.
- Divided fluid cylinder end—individually replaceable cylinders speed maintenance.
- "Slush Proof"® valves—rubber inserts absorb closing shock.
- Large-radius intake manifold—for smoother mud flow and better suction.
- Mud-tight power end—that keeps oil in and mud, dust and rain out.
- Parts accessibility—all parts accessible for field servicing.
- Service and parts facilities—parts and factory-trained pump service specialists readily available.

These are the points that have made Gardner-Denver mud pumps first choice throughout the oil fields.

Write for information on Gardner-Denver mud pumps for any capacity and pressure need.

GARDNER-DENVER
Since 1859
100
1959
YEARS

GARDNER - DENVER

Gardner-Denver Company, Quincy, Illinois

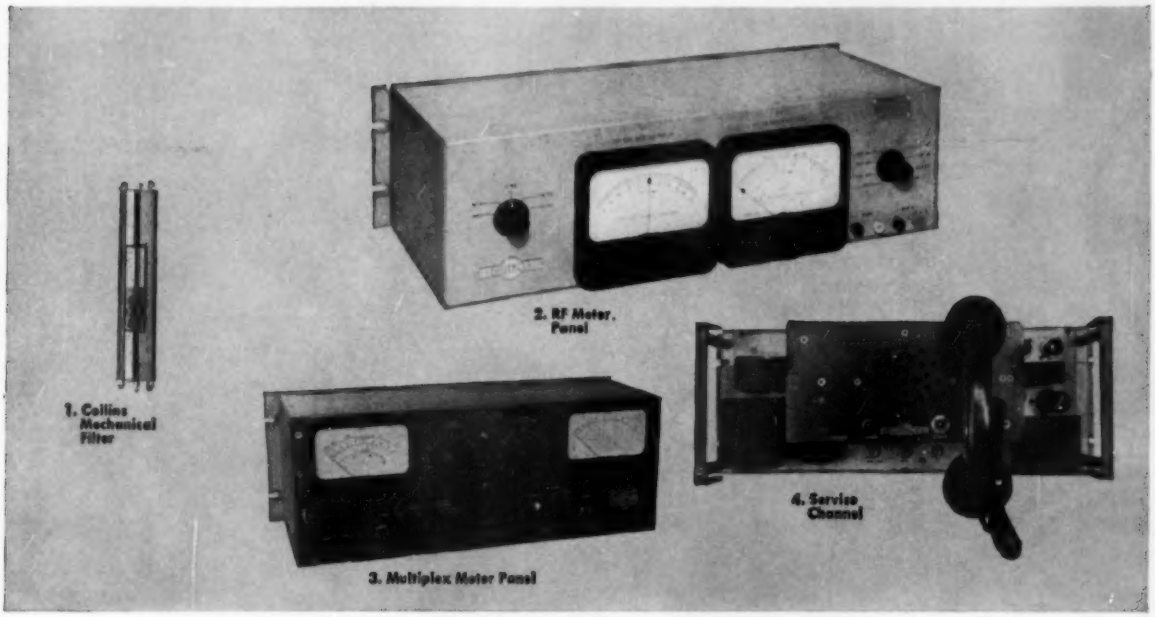
EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario
Gardner-Denver Export Division, 233 Broadway, New York, N. Y.

Oil Field Offices: Dallas, Houston, Tulsa, St. Louis, Los Angeles, New York, Pittsburgh, Denver, New Orleans, Durango, San Francisco, Kansas City, Winnipeg, Edmonton

Here are some Collins Microwave features that can cut your maintenance costs

The electrical and mechanical design of Collins Microwave systems insures low maintenance costs and reduces circuit outages to the absolute minimum



1. Single sideband suppressed carrier multiplexing is simplified and made more economical by the use of Collins' Mechanical Filter. The steep skirt attenuation prevents co-channel crosstalk. The filter is a small, permanently tuned, hermetically sealed unit. Deterioration of system performance by coil aging, humidity, and other detrimental effects is eliminated.

2. Metering and control facilities for preventative and corrective maintenance are built into the equipment. On the front of the RF rack is a self-contained meter panel to check transmitter and receiver oscillator repeller and beam currents and voltages, discriminator balance, received signal levels, mixer crystal current (local oscillator frequency), transmitter frequency reference, transmitter power and relative antenna power. In addition the panel may be used as a voltmeter or milliammeter, using external test leads, to measure at test points throughout the RF, coupling, and multiplex equipment.

3. A test panel for the multiplex equipment provides metering facilities for level measuring and setting, and general purpose audio measurements.

4. The Collins Microwave service channel provides simultaneous voice transmission and reception, with signaling, among all stations in a system on a party line basis. Direct modulation of the microwave equipment is employed without using the carrier facilities.

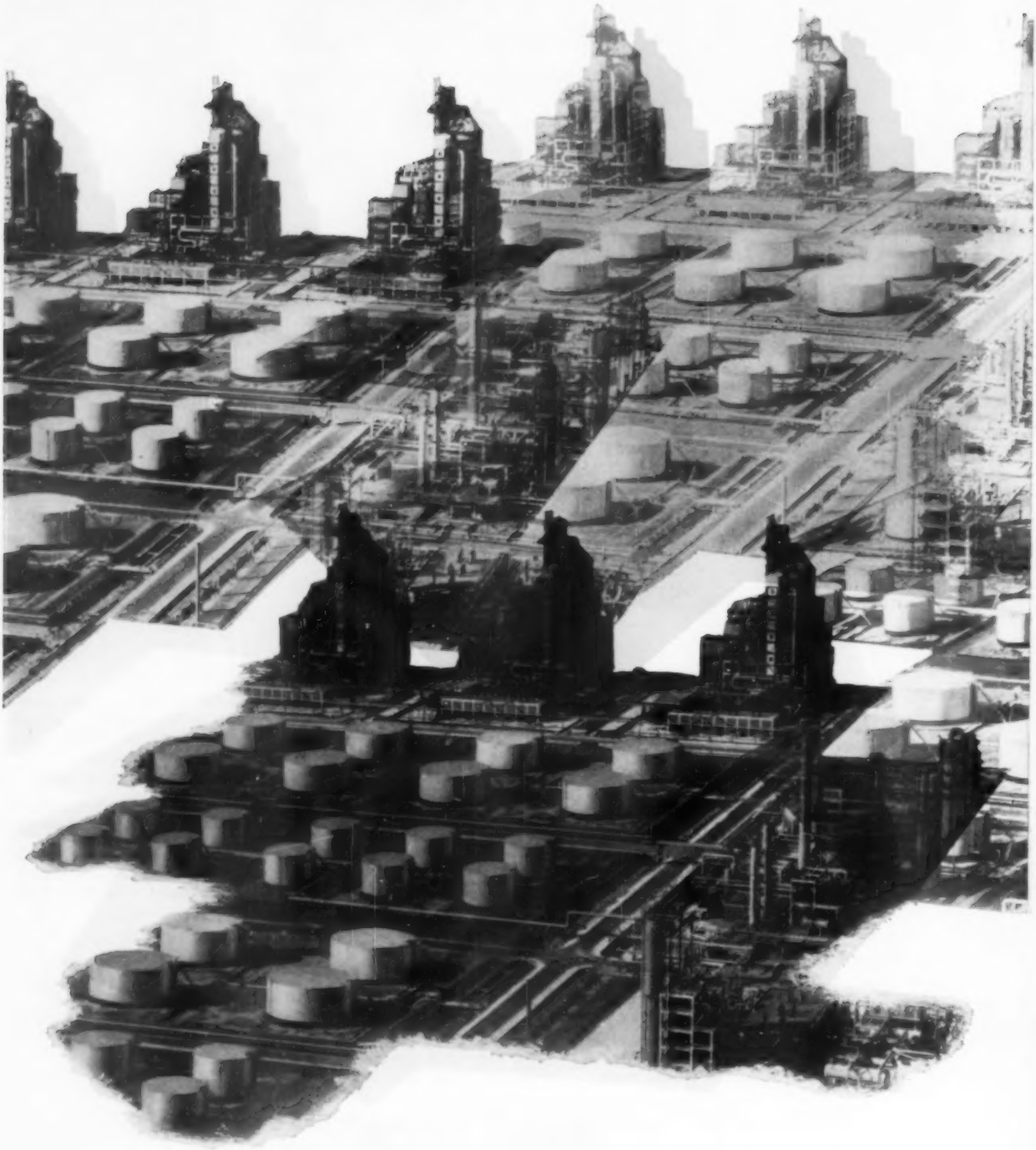
Collins Engineering staff at your service

Our engineers will assist you in evaluating, planning and installing Microwave equipment. Write or call today for further information on Collins Microwave Equipment: Texas Division Sales, Collins Radio Company, 1930 Hi-Line Drive, Dallas 7, Texas.

COLLINS

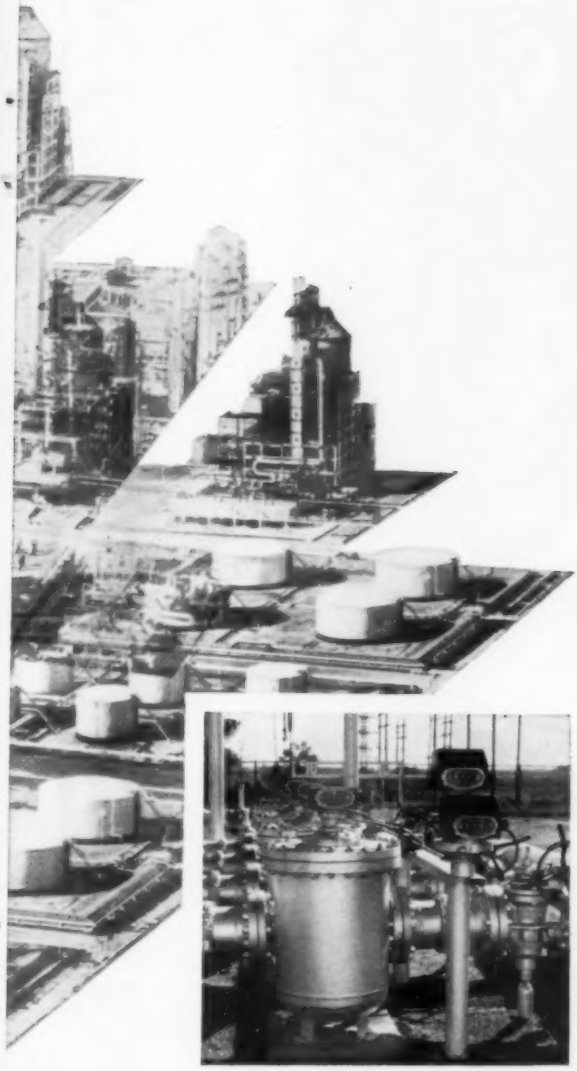
COLLINS RADIO COMPANY • DALLAS • CEDAR RAPIDS • BURBANK

"Engineered



meter systems"-

newest way to refinery expansion without buying real estate



With individual capacities ranging up to 2000 bph, these four A. O. Smith B-200 meters receive crude from a 16-inch line. Meters are connected by combinator units that register total throughout on counter-shifter ticket printer (foreground).

The road to expansion of refining facilities is frequently strewn with barriers — local zoning restrictions, expensive real estate or lack of available adjoining land.

To avert these drawbacks, more and more major pipeliners and refiners are turning to A. O. Smith engineered meter installations. Large volume A. O. Smith meters release measurement tankage for storage purposes . . . provide faster, less complicated throughput . . . reduce overall capital investment . . . slash tank filling and breathing losses.

Equally important, A. O. Smith engineered meter systems provide exceptionally accurate measurement of all transactions.

Before you plan tank-farm expansion you'll be money ahead to consult A. O. Smith. There are meters and accessories for every receiving line — crude, LPG or natural gasoline . . . models for a wide range of operating pressures. And, A. O. Smith meters are equally accurate in measuring finished petroleum products . . . offer similar space saving advantages. Contact your man from A. O. Smith today or write direct:

Through research ...*a better way*

A.O.Smith
CORPORATION

METER, SERVICE STATION PUMP, DIVISIONS

Factories: 5717 Smithway St., Los Angeles 22, Calif.; P. O. Box 500, Succasunna, N. J. Offices: Atlanta 5, Ga.; Chicago 3, Ill.; Houston 2, Texas; Los Angeles 22, Calif.; New York 17, N. Y. Canada: Toronto 12, Vancouver 1. A. O. Smith INTERNATIONAL S. A., Milwaukee 1, Wisconsin, U. S. A.

NEW NEW NEW

The FRANKS SPECIAL YOU'VE BEEN WATCHING FOR

FRANKS EXPLORER

THE EXPLORER IS DESIGNED FOR TODAYS SERVICING AND WORKOVER

AND IS NOT A TEN YEAR OLD MODEL WITH A SOUPED-UP RATING

STAR FEATURES

- INDUSTRIAL ENGINE — Waukesha, Cummins, G.M. or equivalent up to 400 H.P.
- NEW MAIN DRUM DESIGN for fastest, safest pulling.
- NEW WATER AND AIR COOLING BRAKE SYSTEM. (Pat. applied for.)
- NEW HARDENED, REMOVABLE FLOATING BRAKE RIMS.
- NEW CONTROLS for easier, faster, safer handling.
- ALL MODELS AVAILABLE WITH TORQUE CONVERTERS.

Power with a punch to 400 horses, smoothness with converter and torqmatic drive optional. All driving through Franks PTO with oil bath drive. The most powerful self-propelled servicing and workover rig offered.

Powerful with all new special frame, more capacity rear bogies, new removable sand-reel, new guards with new look, engine and power train components easily accessible for maintenance, new fabricating method for strength with more power-to-weight ratio, improved air controls, new axle application and special spring and rocker beam suspension, Franks improved power steering.

Franks winches, masts and derricks have always had the longest life reputation. They are now integrally fabricated into the Explorer, assuring you, the user, of a more rugged trouble free unit, all new from the wheels to the crown.

There are four Explorer models, all new, with industrial power, warranted all new Man-Ten steel frame (no more broken backs), lower center of gravity load, heavier drive lines and power trains.

You'll need more information to fully understand all the Explorer has to offer you. Call a Franks representative for further details.

A GOOD CREW NATURALLY DOES FASTER, SAFER JOBS WITH **Good equipment**

WELL SERVICING AND DRILLING UNITS
FRANKS
DIVISION OF
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FRANKS DIVISION
Cabot Shops, Inc.
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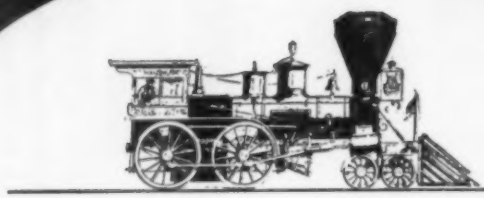
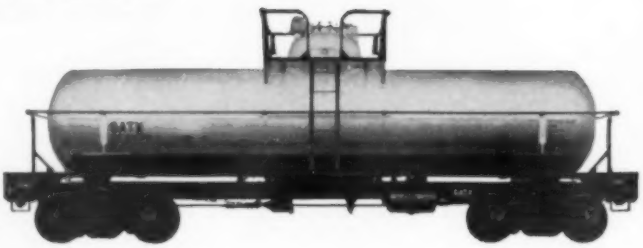


museum pieces are for museums

In 1869, this locomotive was the last word. Today, it is a museum piece.

Not so, your product. If it were, you'd be in the museum business or out of business entirely.

But, if you ship a liquid in bulk, what about the package—the car in which your product goes to market?



Packages are for selling—whether they are on a shelf or on a railway siding. Your product deserves the best package you can find for it.

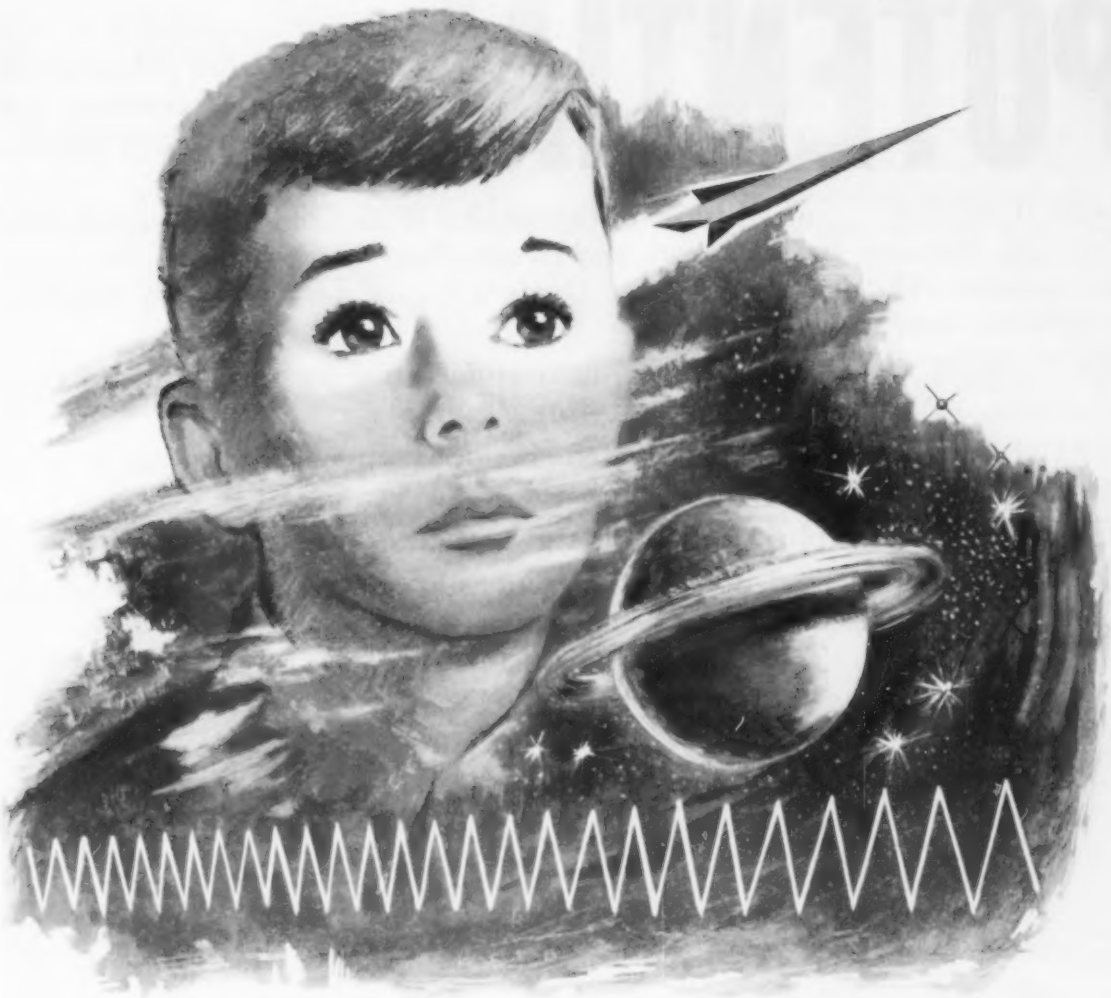
If your product is a liquid shipped in bulk, GATX builds or can build just the package for it—a tank car that protects your shipment and promotes your good name.

GATX operates the cars for you, knows where they are, keeps them on the move and maintains a nationwide network of shops for their service and upkeep.

No capital investment . . . no operating worries . . . when you ship GATX!

GATX GENERAL AMERICAN TRADE MARK

GENERAL AMERICAN TRANSPORTATION CORPORATION
135 South La Salle Street
Chicago 90, Illinois
Offices in principal cities



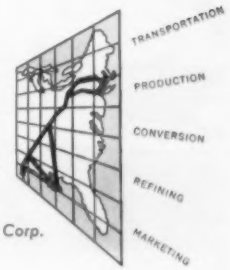
you're as big as you think

Only a boy. But his thoughts are far in the future. Thinking, dreaming, his mind sees more than his eyes do. So with all boys... or business. Vision, looking beyond the commonplace, finds new things to do or make.

In our own industry, for example, natural gas and oil blend with imagination to produce an endless stream of new products and processes.

New ideas and ways of doing that make life more agreeable for all Americans.

From natural gas and oil... heat, power, petrochemicals that mean ever wider service to man.



TENNESSEE GAS TRANSMISSION COMPANY

LEADING PROVIDER OF ENERGY—NATURAL GAS, OIL AND THEIR PRODUCTS

HOUSTON, TEXAS

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POTENTIAL

. . . here's *full* potential for oil refineries, chemical and heavy industrial plants, because . . .

FABRICATION . . . of all types of equipment *(Fractionating Columns, Gas Columns, Pressure Vessels, Plate and Heavy Steel Work, Special Machines, Autoclaves, Shells, Base Bridge Girders)* . . . is performed to order . . . to specification.

MACHINING . . . fully equipped, flexible facilities for machining to close tolerances, regardless of product size or design.

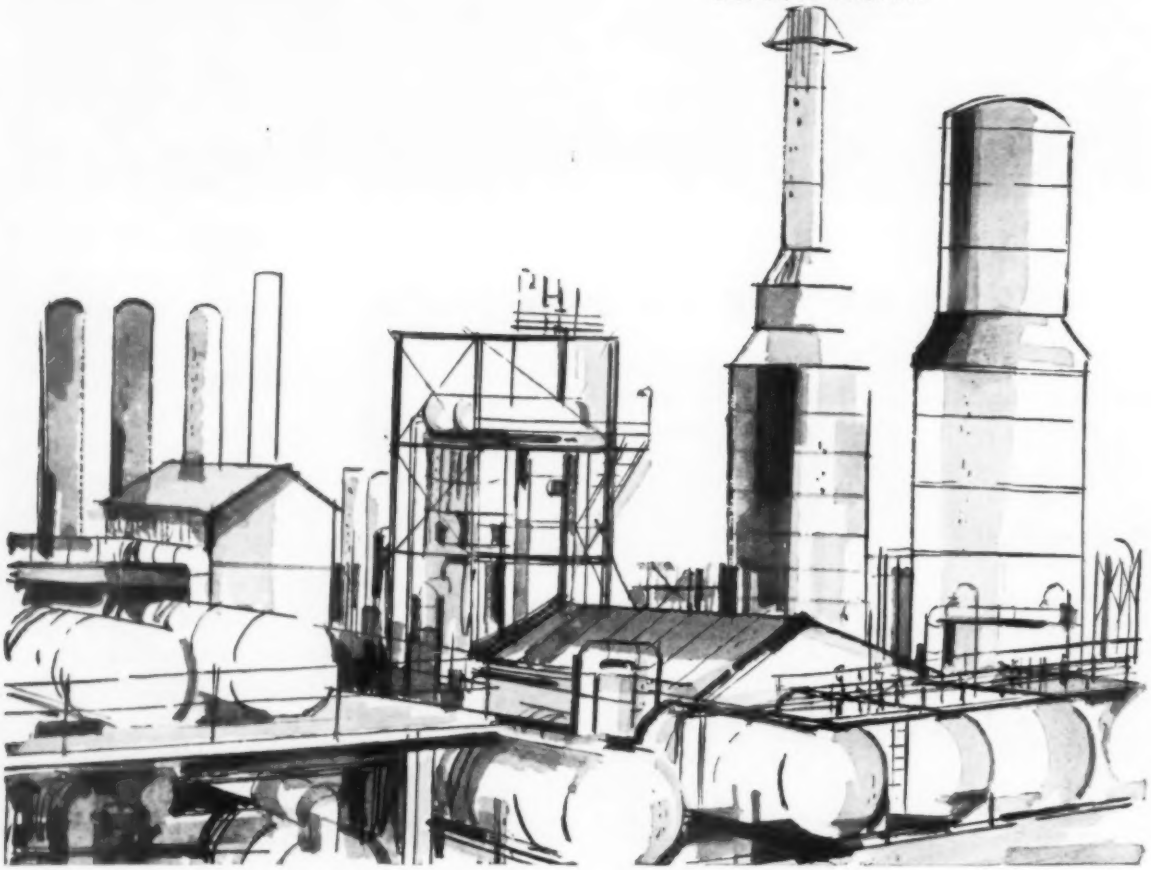
STAINLESS . . . separate, integrated shop for stainless fabrication protects against contamination by ordinary steel.

DELIVERY . . . by rail, truck or inland, coastal or overseas waterway.

Through integrated, efficient operation, Sun Ship can reduce costs . . . increase your POTENTIAL. Call for an estimator or representative.

SUN SHIP

BUILDING & DRYDOCK CO.
CHESTER, PENNSYLVANIA



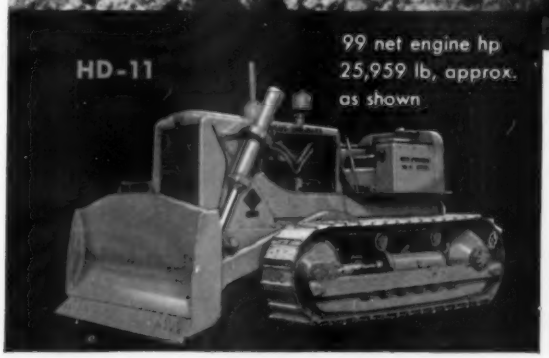
Biggest, most productive 8-ft dozer you can buy...

NEW INSIDE PUSH-BEAM MOUNTING

PORTABLE WITHOUT A PERMIT

The Allis-Chalmers HD-11 inside push-beam tractor-dozer is the heaviest, most powerful machine near its size. This 13-ton tractor-dozer puts more than 20,000 lb of pull and push ability on the job—15% more than any other 8-footer on the market.

Because it's within the 8-ft limit, it's portable anywhere without an overwidth highway permit. In addition, you get wide tread and track for better stability; greater structural strength with the only complete box-A frame available; and a big bonus in over-all balance for steep-grade, slush pit digging.



Your Allis-Chalmers dealer is ready to spell out the HD-11's advantages in versatile working ability. See the HD-11 on your job—in a working demonstration—*and* convince yourself with visual proof.

Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

move ahead with **ALLIS-CHALMERS**

... power for a growing world

Amusement park operators* know that their rides must be exciting to be successful. But with the lives of riders and onlookers at stake, operators rely on *quality* wire rope to ensure . . .

a safe ride

Safety comes first, wherever wire rope is used. You may save a few pennies on the purchase of a "bargain" rope. But it will cost you *more* than you bargained for, if it results in injured personnel and wrecked equipment. Make sure you get *quality* wire rope—buy Wickwire Rope.

**Picture shows the Rocket Ride at Palisades Amusement Park, Fort Lee, N. J. Wickwire Rope provides the only support for each of these planes.*

CF&I WICKWIRE ROPE A CF&I PRODUCT

LOOK FOR THE YELLOW TRIANGLE

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver El Paso • Farmington (N. M.) • Fort Worth • Houston • Kansas City • Lincoln • Odessa (Tex.) • Oklahoma City Phoenix • Pueblo • Salt Lake City • Tulsa • Wichita • **PACIFIC COAST DIVISION**—Los Angeles • Oakland • Portland San Francisco • San Leandro • Seattle • Spokane • **WICKWIRE SPENCER STEEL DIVISION**—Boston • Buffalo • Chattanooga Chicago • Detroit • Emlenton (Pa.) • New Orleans • New York • Philadelphia 6347

COLORS

in fluid form

DYE CONCENTRATES*

by **PATENT CHEMICALS**

the Pioneers in Petroleum Dyes

FOR CLEANER, EASIER COLORING OF PETROLEUM PRODUCTS; ELIMINATES PRE-DISSOLVING, DUSTING, OPERATOR EXPOSURE • LESS SKILL AND EQUIPMENT REQUIRED: INTRODUCED DIRECTLY INTO THE FINISHED PRODUCT • THE ANSWER TO BULK, TANK TRUCK, TANK CAR, BARGE, TERMINAL AND PIPELINE COLORING • CAN BE USED WITH DRY DYE EDUCTOR EQUIPMENT • THE USE OF DYE CONCENTRATE INVOLVES NO ADDITIONAL COST COMPARED TO ORDINARY DRY DYES.

FOR USE IN

Gasolines — Diesel Fuels — Fuel Oils — Lubricating Oils
Automatic Transmission Fluids — Break-in Oils and Greases

Also Available in Dry Dye Form.

Dye concentrates can be prepared to customer specifications.

•

Samples and description upon request.

PATENT CHEMICALS, INCORPORATED

MANUFACTURERS OF DYES AND CHEMICALS FOR THE PETROLEUM INDUSTRY

CALL US COLLECT FOR FAST ACTION

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NOTE: — *Reds — Yellow — Orange — Blue — Meet Mil-F-5572 Specifications*

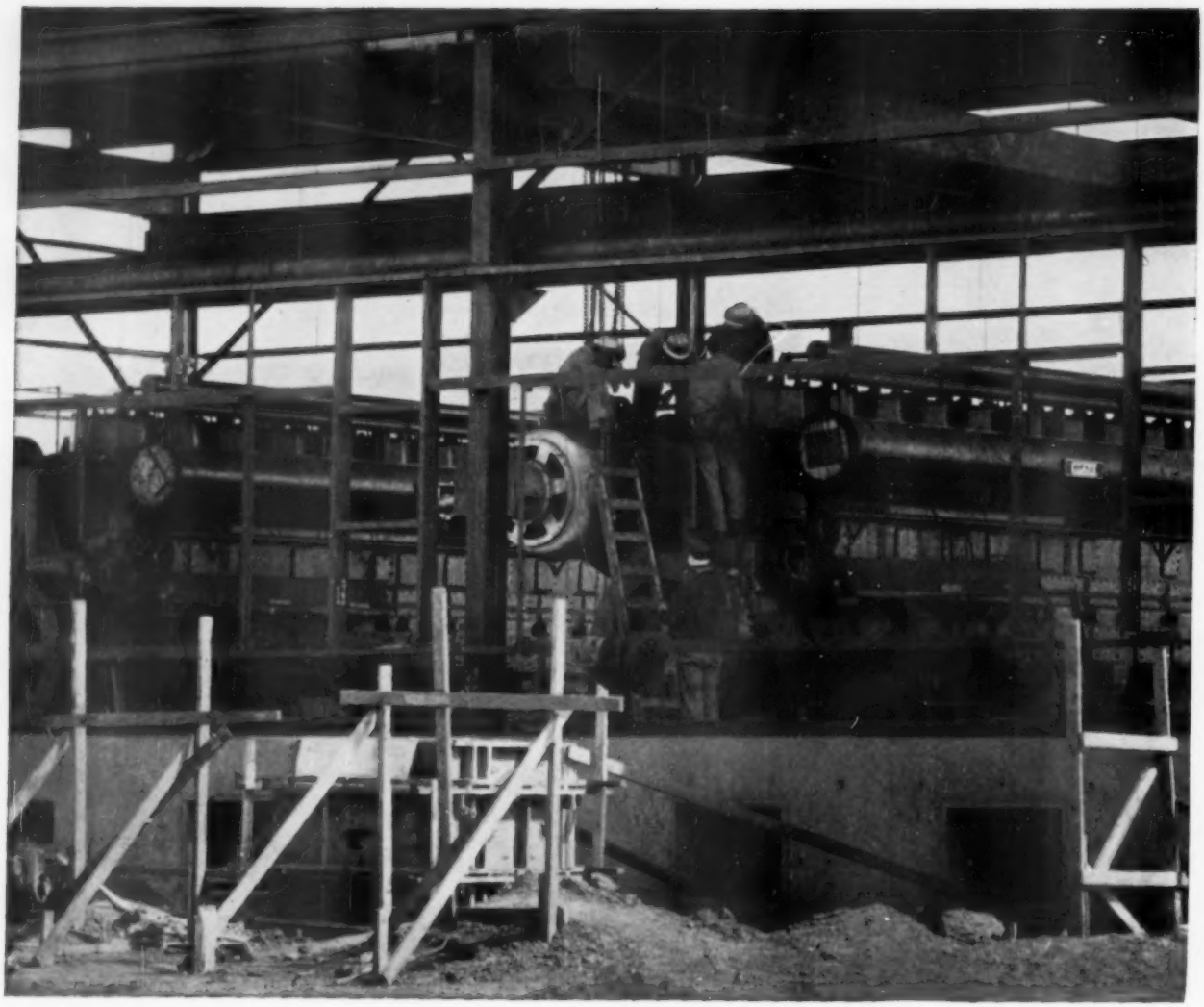
*Patent Pending

PATENT CHEMICALS INC.

Manufacturing Division: 335 McLean Blvd., Paterson 4, New Jersey

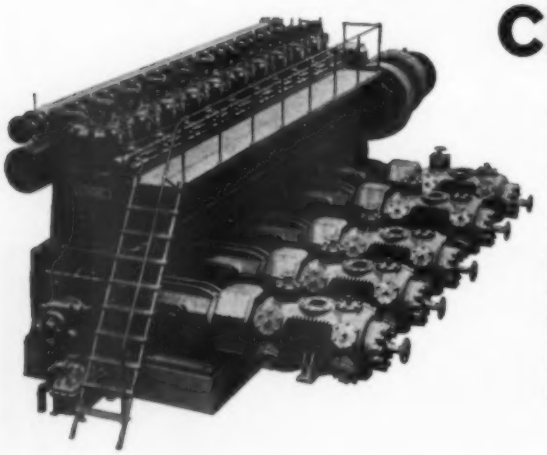
PATENT FUELS & COLOR CORP.

Marketing Division: 2410 Carew Tower, Cincinnati 2, Ohio



NINE CLARK TLA-10's

Clark turbocharged



Nine Clark 3400 bhp. turbocharged, 2-cycle TLA-10's will soon be handling all of Trans-Canada's compressor requirements for the big 34" western section of one of the world's largest gas pipelines. Here in the prairie provinces, loads will be the heaviest . . . dependability and economy of operation a must. But that's no problem with modern TLA-10's on the job. They are specifically designed for 3400 bhp. loads with no encroachment upon overload carrying ability. If extra power is needed to meet emergencies, it is there for the taking.

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Whether you are planning to core hard, friable or soft, unconsolidated formations, there is no need for guesswork. Let Christensen show you how to get more from your investment by obtaining complete, lasting evidence of the formation below your rig. Christensen Diamond coring equipment gives you the greatest amount of core recovery at "Less Cost Per Foot."

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They Say—

In 1959, a better impression

Dear Sir:

I have read with a great deal of interest your article entitled "New Oil in New Places" in the November 10 issue of The Oil and Gas Journal (p. 205).

I feel a great deal as you do about geologists and their shortcomings, and I feel that in this year of 1959, which is the centennial of the oil industry, our major objectives are to organize the independent oil man into a workable organization, and to publicize the oil industry as it has been and as it is, rather than give the impression to the general public that we are a bunch of spoiled, luxury-loving degenerates.

John A. Jackson
Geologist
Dallas.

It was our privilege, too

Dear Sir:

All of us at D-X Sunray believe your editors did an excellent job on the Tulsa refinery story that appeared in the January 5 issue of the Journal (p. 92). The photographs and the flow diagrams were particularly well arranged.

We consider it a real privilege to have such a story in your publication.

Harry A. Brown
Vice President, Manufacturing
D-X Sunray Oil Co.
Tulsa.

Author sticks by figures

Dear Sir:

In response to the query posed by Gerald Bayern in the "They Say" column (OGJ, Jan. 19, p. 44) regarding the probable future level of supply of ammonia as contained in my article "Ammonia Supply and Demand . . . In Balance by 1961?" (OGJ, Dec. 15, 1958, p. 109), I wish to submit the following:

Firstly, Mr. Bayern has undoubtedly overlooked the following qualified statement made in the first paragraph . . . "provided, of course, that there is no further increase in ammonia capacity beyond that now contemplated." "Now" refers to the time period during which this study was prepared. Thus, plans for additional ammonia capacity scheduled to come on stream by 1961 which remained unannounced

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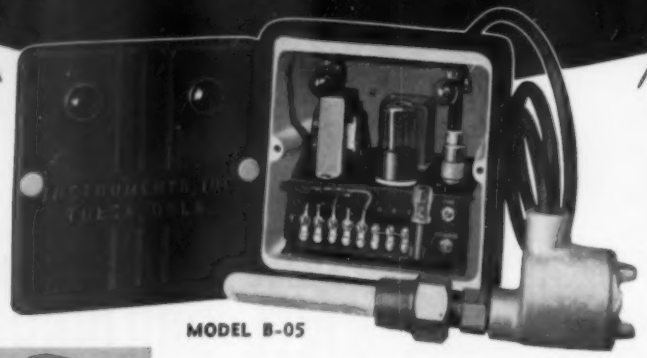

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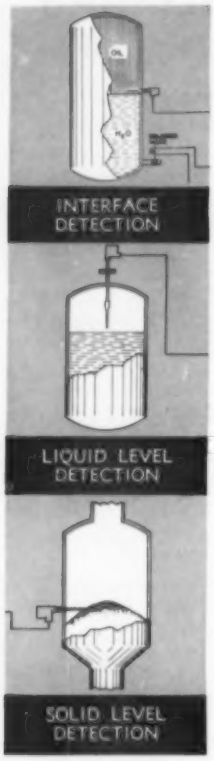

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PIONEERS IN LEVEL MEASUREMENT AND CONTROL INSTRUMENTATION

at the time of the study could not have been included in the analysis.

However, when additional capacity becomes known, or when developments influencing future levels of imports and exports become defined, an adjustment of the appropriate figures on the supply side of Table 2 may be easily made in accordance with the instructions at the head of the table.

Secondly, it is interesting to note that over the near term (1959-61), the probable impact of the developments as cited by Mr. Bayern in points 2 and 3 upon imports and exports could have only a negligible effect upon the demand-supply balance. Imports or exports when related to the over-all level of demand are rather small.

Jack Melnick
Consulting Economist
New York.

Nitrogen conclusions jibe

Dear Sir:

We appreciate the careful attention Mr. Gerald Bayern has given the data we have assembled (OGJ, Dec. 15, p. 109, and They Say, Jan. 19, p. 44). We do not feel, however, that the conclusions resulting differ substantially from ours.

Please note the following: (1) Our conclusion that serious overcapacity will disappear by 1961 was followed by an important provision . . . "provided, of course, that there is no further increase in ammonia capacity beyond that now contemplated." (2) We specifically recognize that there will be regional differences in supply-demand balance. (3) The title of the article does include a question-mark.

Jules Joskow
Boni, Watkins, Jason & Co.
Management and Economic Consultants
New York

Good news for Argentina

"Contracts have been signed by the Argentine Government with foreign companies for the development of Argentina's oil resources. This is good news for the Argentine economy.

"The simple fact is that Argentina has the oil but cannot get it out of the ground without outside help. And, since $300 million of its annual foreign-exchange deficit of $360 million goes for oil imports, it is easy to appreciate the importance of Argentine oil self-sufficiency."

Editorial in the New York Herald Tribune.

Letters to They Say should be addressed to The Editor, The Oil and Gas Journal, Box 1260, Tulsa, Okla.

CALENDAR OF EVENTS

JANUARY

26-29 Tenth annual plant maintenance and engineering conference, sponsored by Clapp & Poliak, Inc., Public Auditorium, Cleveland.

28-29 Annual Midwest Welding conference, sponsored by Armour Research Foundation of Illinois Institute of Technology, and American Welding Society, Chicago section, Illinois Institute of Technology, Chicago.

30-31 Oklahoma Society of Professional Engineers, annual meeting, Mayo Hotel, Tulsa.

FEBRUARY

1-4 American Association of Petroleum Geologists, Rocky Mountain section, ninth annual meeting, Civic Auditorium, Albuquerque, N. M.

1-6 American Society for Testing Materials, D-2 committee on petroleum products and lubricants, Sheraton-Jefferson Hotel, St. Louis.

2-22 Southwestern Legal Foundation, course on oil and gas law, Southwestern Legal Center, Dallas.

11-13 Southwestern Legal Foundation, tenth annual institute on the law of oil, gas, and taxation, Southwestern Legal Center, Dallas.

11-13 National Association of Corrosion Engineers, Tulsa section, tenth annual pipeline corrosion short course, Mayo Hotel, Tulsa.

15-19 American Institute of Mining, Metallurgical, and Petroleum Engineers, annual meeting, Sir Francis Drake Hotel, San Francisco.

16-18 American Management Association, seminar on management problems of exploration and production, Hotel Astor, New York.

18-21 National Society of Professional Engineers, winter professional meeting, Dinkler-Tutwiler Hotel, Birmingham, Ala.

24-25 University of Oklahoma, sixth geological symposium, Norman, Okla.

25 Petroleum Equipment Suppliers Association, Mid-Continent and Rocky Mountain district meeting, Mayo Hotel, Tulsa.

24-26 Oklahoma State University, natural-gas engineering conference, Stillwater, Okla.

26 American Society for Testing Materials, southwest district annual meeting, Houston.

26-28 Pipe Line Contractors Association of Canada, fifth annual convention, Castle Harbour Hotel, Bermuda.

27 Natural Gasoline Association of America, Permian basin regional meeting, Scharbauer Hotel, Midland, Tex.

MARCH

3 Petroleum Equipment Suppliers Association, Pacific district, annual membership meeting, Ambassador Hotel, Los Angeles.

4-5 University of Oklahoma, gas-processing conference, Norman, Okla.

4-6 American Petroleum Institute, Division of Production, southwestern district meeting, Hotel Scharbauer, Midland, Tex.

5-6 Southern Gas Association, transmission management conference, Jung Hotel, New Orleans.

6 Natural Gasoline Association of America, Gulf Coast regional meet-

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7 American Chemical Society, Oklahoma tetrasectional meeting, University of Tulsa, Tulsa.

8-11 American Society of Mechanical Engineers, gas turbine power conference and exhibit, Netherlands-Hilton Hotel, Cincinnati.

9-11 Midwest Gas Association, annual meeting, Hotel Fort Des Moines, Des Moines.

11 Petroleum Equipment Suppliers Association, southwestern district, annual membership meeting, Shamrock Hilton Hotel, Houston.

13 American Institute of Chemical Engineers, Sabine area section; American Chemical Society, Texas-Louisiana Gulf section; sixth annual joint technical meeting, Lamar State College of Technology, Beaumont, Tex.

16-18 Western Petroleum Refiners Association, forty-seventh annual meeting, Hilton Hotel, San Antonio, Tex.

16-19 American Association of Petroleum Geologists, Society of Economic Paleontologists and Mineralogists, forty-fourth annual meeting, Memorial Auditorium, Dallas.

16-20 National Association of Corrosion Engineers, fifteenth annual conference, Hotel Sherman, Chicago.

17-18 Manufacturing Chemists' Association, air and water-pollution abatement conference, Netherlands Hilton Hotel, Cincinnati.

18 Petroleum Equipment Suppliers Association, eastern district, annual membership meeting, Duquesne Club, Pittsburgh.

19-20 New England Gas Association, annual meeting, Hotel Statler, Boston.

21 North Texas Oil and Gas Association, twenty-ninth annual meeting, Kemp Hotel, Wichita Falls, Tex.

23-24 University of Oklahoma, second conference on theory of fluid flow through porous media, Norman, Okla.

25-27 American Petroleum Institute, Division of Production, southern district meeting, Roosevelt Hotel, New Orleans.

31 Seventh annual meeting, Philadelphia-Wilmington section of American Institute of Chemical Engineers, and University of Pennsylvania, Philadelphia.

29-Apr. 2 American Society of Mechanical Engineers, instruments and regulators division conference, Case Institute of Technology, Cleveland.

APRIL

2-3 Society of Petroleum Engineers of AIME, Rocky Mountain petroleum section, Casper, Wyo.

2-3 American Institute of Mining, Metallurgical, and Petroleum Engineers, technical conference on stress corrosion, Mellon Institute, Pittsburgh.

2-6 Geological Society of America, Cordilleran section, annual meeting, University of Arizona campus, Tucson.

5-10 American Chemical Society, national meeting, Boston.

5-10 Engineers Joint Council, nuclear congress, Cleveland Auditorium, Cleveland.

6-7 Instrument Society of America, second national symposium on chemical and petroleum instrumentation, St. Louis.

7-8 Sixth Gas Compressor Institute, sponsored by University of Kansas and Southwest Kansas petroleum industry, Randall's Cafeteria, Liberal, Kans.

TWENTY-FIVE WELL DERRICK

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JOURNALLY SPEAKING

Out on the Old Limb

PAUSE, kind friend, and shed a tear for the poor forecaster.

When his predictions turn out right, he goes unnoticed, unhonored, and unsung. But if they turn out even a little bit wrong, he catches blazes from every direction.

The world's best joke has always been the raining out of a weather forecaster's picnic.

Nevertheless, the Journal again sticks its neck out in this annual review and forecast issue. So before you start questioning the value of predictions in general and ours in particular, give heed to some of the problems a forecaster is up against.

On page 120 you will see that we predict 52,746 wells will be drilled in the United States in 1959. Two questions may occur to you:

1. How was the figure arrived at?
2. What assurance is there that the forecast will come true?

The answer to the first question is easy—easy, that is, if you understand the intricacies of statistical sampling and extrapolation. We send questionnaires to every producer, large or small, who regularly operates on an annual budget and maps out a tentative drilling program for the year.

We get very good returns, too, although we would like to have even more and better replies. Even so, we get what we consider to be a big enough cross-section of the industry to show the trend.

Then John Casper, our chief economist and extrapolator extraordinary, spends many days applying a method too complicated to explain here but which results in an estimate of what the entire industry will do—provided the nonreporting operators follow the trends developed from the sample. Both the assumption and the method are statistically sound when based on a good sample.

But the second question involves things outside the ken of any forecaster—unless he professes to foretell the condition of the oil industry by reading tea leaves or an astrology chart.

In the first place, even the most convention-bound companies change their minds during the year. Many things can happen to cause them to make revisions in their drilling schedules.

In the second place, those operators who don't work on definite drilling programs "play it by ear." Their drilling budgets are quite flexible, subject to change without notice. If conditions are favorable they may drill more wells than anybody could anticipate—or less.

So what our drilling forecast boils down to is this: The best estimate, based on January conditions, of what the industry as a whole plans to drill during the coming 12 months.

Naturally there are a lot of "ifs" in this. So every July we make another survey and issue a midyear revision. And here's our score in recent years:

	January forecast	Midyear revision	Actual completions
1952	45,446	45,791	45,821
1953	46,230	47,873	49,279
1954	48,410	51,540	53,930
1955	54,444	56,430	56,682
1956	58,062	57,889	58,160
1957	60,057	55,434	53,838
1958	52,134	48,949	49,111

Look at that 1956 line! Something to brag about, eh? But in all fairness we should be as modest as Colonel Lindbergh was when he flew the Atlantic and came out of the fog directly over his check point on the tip of Ireland. He said if he had come within 30 miles of it he would have considered it good navigation, but hitting it on the nose was pure luck.

So many things can happen to influence drilling, that if any forecast hits it on the nose it's pure luck. For instance, who could have anticipated the flurry in Green County, Kentucky, this fall, where 800 shallow wells were drilled?

All of which is to say that our drilling forecasts are mighty good if you understand how they are prepared and know how to use them. Now take our 1959 forecast of 52,746 completions. As the months roll by, make your own estimate of the "feel" of the industry and of changing conditions that may push drilling up or down.

And shed a tear for us if our forecast is off the beam.

—Henry D. Ralph

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1959: Better, but no boom

THE outlook for the oil industry is for improving business in virtually every phase of activity as compared with 1958.

This is evidence that the oil industry has weathered the recession, eliminated the worst of its trouble spots, and is in position to join with the rest of the economy in an upward movement.

Now the main danger facing the industry is its own eternal optimism. Things are going to be a little bit better, but not enough better to justify unrestrained expansion of capacity and output.

ON A PERCENTAGE BASIS 1959 promises some attractive increases in business. But it must be remembered that this is simply a comparison with the extremely poor year of 1958. When the forecast is translated into actual numbers of barrels, wells, dollars, or other units the volume turns out to be quite modest.

Crude production is an example. There is a prospect that domestic crude output may be about 8% above 1958. But this is only about 500,000 bbl. per day. And there are 500,000 producing wells in the United States. So the demand would be met if each well increased its output by 1 bbl. per day. Of course many strippers can't make that, but even so the increase in allowables for the other wells is not going to be spectacular.

Drilling is another example. The forecast is an increase of some 7.5% in total completions. That is a considerable improvement but it will still leave 1959 drilling a bit shy of the 1957 rate and far below the 1956 peak.

Similar comparisons can be shown in nearly every branch of the industry. The point is that the forecasts should be interpreted realistically in terms of the actual volume of business in sight.

What the figures for 1958 and the forecasts for 1959 really show is that this industry has passed the bottom of its "saucer depression" and is gradually moving up to higher levels. No big jump in activity should be anticipated, but rather a return toward a long-range trend of average annual increases.

THE READJUSTMENT PERIOD to the lower levels of the past couple of years is over and most of the industry is in fairly good shape to take advantage of the improving demand. Most inventories, for example, have been worked down to a reasonable level.

But there is still more capacity to drill, to produce, to refine, than required by the 1959 prospects. This means that caution should still rule every individual operator's forward planning.

If overoptimism breeds overbuilding and overproduction, the industry could find itself with mounting surpluses and low unit profits impairing its ability to enjoy the upturn in the general economy.

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4. Refinery for Societe Generale des Huiles de Petrole at Dunkirk, France
5. "Portable" refinery for U. S. Navy Department
6. Lube oil refinery for Cit-Con Oil Corporation at Lake Charles, Louisiana
7. Refinery for International Refineries Inc. at Wrenshall, Minnesota
8. Refinery for Vacuum Oil Company Ltd. at Coryton, England
9. Refinery for Burmah-Shell Oil Company at Bombay, India
10. Refinery for Standard-Vacuum Oil Company at Bombay, India
11. Refinery for Standard Oil Company (Indiana) at Mandan, North Dakota
12. Refinery for Suntide Refining Company at Corpus Christi, Texas
13. Refinery for Commonwealth Refining Company at Ponce, Puerto Rico
14. Refinery for Esso Standard Oil Company at Antwerp, Belgium
15. Refinery for Caltex at Visakhapatnam, India
16. Refinery for Neste Oy at Turku, Finland
17. Refinery for Irish Refining Co., Ltd., Cork, Ireland
18. Refinery for Esso Standard Française, Bordeaux, France
19. Refinery for Purfina Mineraloelraffineria A.G., Duisburg, Germany
20. Refinery for B. P. Canada Limited, Ville d'Anjou, Montreal, P.Q., Canada

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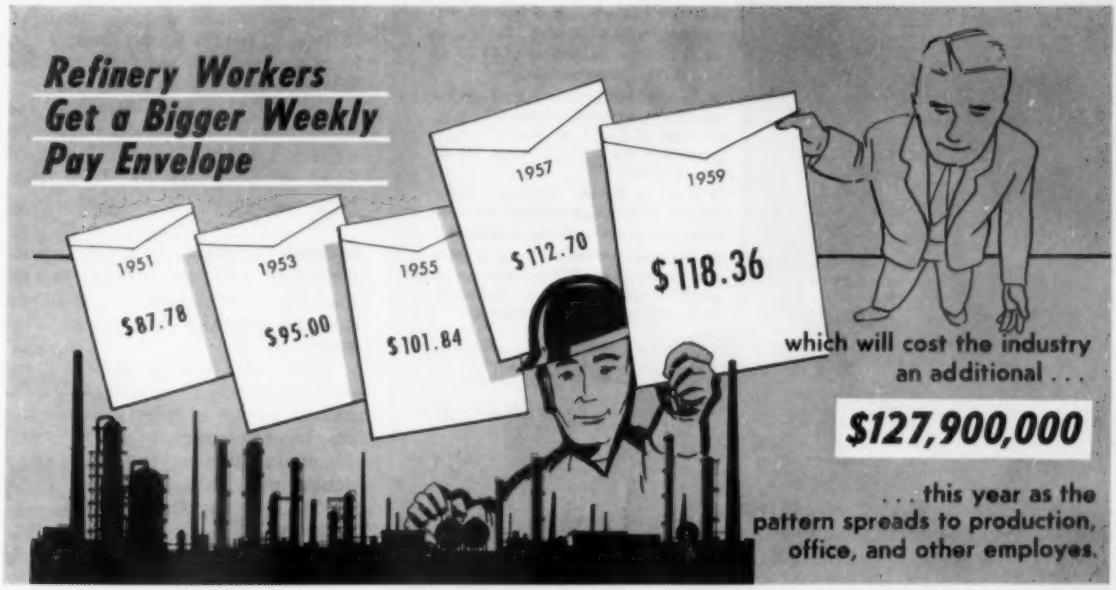


Oil to Dig Deep to Meet Wage Boost

• Pattern-setting 5% pay increase, averting industry strike threat, adds $127,900,000 to oil's wage bill this year. Drilling contractors are only segment of industry not following the trend.

THE NEW ROUND of raises was spreading through the industry last week, with oil men figuring out how big a bite it will take out of already pinched profits.

The increased labor costs hit the industry—now pulling out of the recession—just as a new round of crude-price reductions cut further into producers' income (p. 102).

Although pushed through by refinery workers—most of them members of the Oil, Chemical, and Atomic Workers International Union—the pay hikes were being passed along by major companies to production, pipeline, and office employes.

Following suit, reluctantly, were independent producing companies, service companies, and natural-gas and LPG firms. Most termed the higher labor costs economically infeasible, but said they were forced to go along to remain competitive for manpower.

One segment of the industry is balking at the pay raise. A number of drilling contractors told the Journal they would not be able to follow the pattern. Each cited idle rigs and low drilling prices in contending there is no justification for a wage increase now. Several said they are unable to absorb higher labor costs and could not pass them along to oil companies.

Here's what the 5% pattern means:

. . . **For about 450,000** refining and production employes, it adds up to an extra 13½ to 14 cents an hour—slightly more than half of the 25-cent wage demand laid down originally by unions.

. . . **Oil companies** will pay an additional $2,460,000 per week in wages.

. . . **About 122,000 refinery** workers will be making a national average of $2.97 an hour, compared with $2.83 last year.

. . . **More than 300,000** production employes will be earning an average hourly wage of $2.81½, compared with $2.68 during 1958. That is on the basis of the same number of hours, overtime, and holiday time worked as last year.

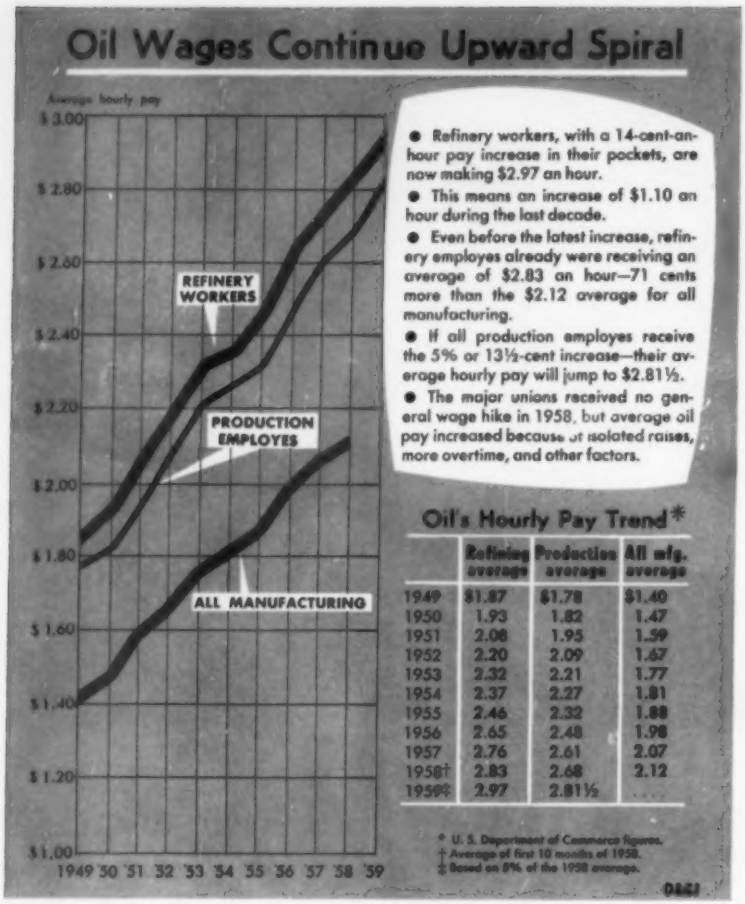
. . . **It will benefit** other industry employes, including white collar and supervisory personnel not represented by unions. Most major companies granted the pay increases to nonunion employes before making the 5% offer to unions.

Walkouts averted . . . Company offers came during last-ditch negotiations on several fronts.

The action lifted the threat of strikes which conceivably could have shut down one-half of the nation's refining capacity (OGJ, Jan. 19, p. 59).

The pattern was set during eleventh-hour bargaining in Kansas City between the OCAW and Sinclair Oil Corp. Sinclair holds the only nationwide contract with OCAW, covering 9,000 employes. OCAW's other contracts are on a plant-by-plant basis.

Sinclair broke the ice with the 5% offer. In making the proposal, Millard E. Stone, vice president and director of industrial relations for Sin-


Oil Wages Continue Upward Spiral
Average hourly pay
$3.00
$2.80
$2.60
$2.40
$2.20
$2.00
$1.80
$1.60
$1.40
$1.20
$1.00
1949 50 51 52 53 54 55 56 57 58 59
REFINERY WORKERS
PRODUCTION EMPLOYES
ALL MANUFACTURING
● Refinery workers, with a 14-cent-an-hour pay increase in their pockets, are now making $2.97 an hour.
● This means an increase of $1.10 an hour during the last decade.
● Even before the latest increase, refinery employes already were receiving an average of $2.83 an hour—71 cents more than the $2.12 average for all manufacturing.
● If all production employes receive the 5% or 13½-cent increase—their average hourly pay will jump to $2.81½.
● The major unions received no general wage hike in 1958, but average oil pay increased because of isolated raises, more overtime, and other factors.
Oil's Hourly Pay Trend*
Refining average
Production average
All mfg. average
1949 $1.87 $1.78 $1.40
1950 1.93 1.82 1.47
1951 2.08 1.95 1.59
1952 2.20 2.09 1.67
1953 2.32 2.21 1.77
1954 2.37 2.27 1.81
1955 2.46 2.32 1.88
1956 2.65 2.48 1.98
1957 2.76 2.61 2.07
1958† 2.83 2.68 2.12
1959‡ 2.97 2.81½ . . .
* U. S. Department of Commerce figures.
† Average of first 10 months of 1958.
‡ Based on 5% of the 1958 average.
OGJ

clair, stated, "There is no economic justification for a wage increase at this time . . . However, we have made this offer in an attempt to avert a crippling strike in oil, recognizing that such a stoppage could seriously set back the nation's economy at a very critical time."

Other major companies quickly followed Sinclair's lead.

OCAW leaders recommended acceptance of the 5% wage increases in settlement of the wage disputes. Ratification by the union's 105,000 members in the oil industry was expected to take a week or so.

OCAW President O. A. Knight reportedly was pressing locals to accept the offers so that most contracts would have a common termination date. This would strengthen the union hand in future negotiations.

There was also talk among some union locals that the strike threat could reappear in June, and some companies were seeking to write in 1-year strike freezes over future increases to head off such a move.

Bringing up the question of a possible renewed demand this spring or summer was J. Elro Brown, OCAW Gulf Coast district director. In pointing out Sinclair's 2-year contract expires in mid-June, he indicated the union might want to reopen the wage issue at that time. "I don't know what the cost of living will do, but the prospects are it will be increasing," he said.

However, most major companies are not overly concerned about the wage reopener clause. They have closed the books on 1958 and consider the current raise is for 1959. They expect it to last a year, at least, and express no fear of the union coming back this summer asking for more.

One company spokesman pointed out: "If they did come back this year, the answer definitely would be, 'No'."

Another said that Brown was merely "shaking the bush" with his statements about the possibility of a reopener this summer, trying to get companies to settle side issues existing at some plants.

Pattern setter . . . Sinclair's settlement was the 5% increase effective as of January 18.

The company and the OCAW also reached agreement on fringe benefits, such as sick and accident, savings, and retirement plans.

On the pension plan, both sides agreed to review the program separately, making recommendations for any changes by May 31.

The union said the 5% means an average of 13½ cents more an hour for refinery workers' pay envelopes, figuring it on a national average of $2.71 an hour. However, the $2.71 figure is the basic wage, and refinery workers actually averaged $2.83 an hour last year with overtime and holiday time included.

Industry comments . . . The general feeling of company spokesmen was that the current economic situation does not justify an increase in labor costs.

Humble Oil & Refining Co.'s President Morgan J. Davis said, ". . . the present pattern of wage increases can only serve to feed an inflationary trend which, in the long run, may prove detrimental to all.

"These increases come at a time when the petroleum industry is still suffering from production cutbacks and other effects of the recent recession. They come in the face of depressed demand for domestic crude oil, of weakness in prices, and of substantially increased unit costs.

The president of one larger independent Texas producing company was almost angry at the increase, but said he would have to fall in line.

"It shouldn't be paid," he said. "As far as earnings go, they shouldn't get a raise. I hate to see it. We're having cuts in the price of crude, and they are still going on.

"Why is it the oil industry is the one that gives wage increases but doesn't get a price increase for crude? In the steel industry, if you give an increase, you increase the price of steel."

A service company official said he was "not particularly happy," but an industry wage hike "rubs off on us because in the recruitment of new people, we are sometimes competing directly with the oil companies." He added there has been no increase in productivity or profit.

A drilling contractor was highly critical of oil companies for making the pay increases.

"We can't meet it with the high percentage of rigs down," he said. "We can't absorb a pay raise, and we can't pass it on. The oil companies won't let us. We're caught in a real tight squeeze. If oil doesn't take a little more recognition of our industry, we're going to be forced to open our doors to union people."

Can a State Set Casinghead Prices?

• In Oklahoma's Ringwood field the state must decide whether it can use its conservation powers to raise gas prices in order to extend the life of this marginal oil field, even if it means voiding existing gas contracts.

THE "sorriest oil field in Oklahoma" is now a battleground in a test of the state's authority to raise gas prices in the name of conservation.

There is probably nothing quite like Ringwood field anywhere else in the country.

But if the Oklahoma Corporation Commission should set minimum prices for gas there it could establish a precedent for similar action elsewhere in Oklahoma and perhaps in other states.

The gas in question is casinghead gas, gathered and processed in what has been called purely salvage operation and yielding producers slightly under 3 cents per M.c.f. Six times in 6 years, in actions before the OCC and the courts, producers have tried unsuccessfully to get out of their contract.

Now the producers are seeking to have Ringwood reclassified as a gas field. This would permit the OCC to set a price of 10 cents per M.c.f. under the state's minimum-price law. All the gas is taken by Oklahoma Natural Gas Co., which sells it within the state, so no question of interstate commerce is involved.

In a bitterly fought week-long hearing, the issues were laid before the commission for decision. Producers, royalty owners, and the commission's own conservation division contended that a higher price would increase ultimate recovery of both oil and gas, prevent current physical and economic waste, and protect correlative rights of producers.

Gas purchasers contended that a higher price would cause immediate abandonment of the entire field, that the commission has no jurisdiction over the price of casinghead gas, and that resort to the conservation law is a "subterfuge" to void a valid contract.

How it started . . . Ringwood field, in Major County of northwestern Oklahoma, was discovered in 1946, but development was slow because of low productivity and lack of gas market.

Principal production is from the Manning oil and gas zone, but a few wells also produce from the lower Cherokee condensate formation.

Half a dozen companies studied plans for gathering and processing the gas but decided it was uneconomic. The gas is lean, scattered, and of such low pressure that much compression is needed to get it to a plant.

Finally Warren Petroleum Corp. and Oklahoma Natural Gas Co. worked out what they called a salvage deal. Warren built a natural-gasoline plant and ONG laid gathering lines and built compressor stations. When the plant was opened in 1952 it was hailed as a milestone in conservation.

Producers signed what was described as a standard casinghead-gas contract on a plant-payout basis. Warren gave producers one-third of the proceeds from sale of liquid products (currently the equivalent of about 3 cents per M.c.f.) until recovery of investment. Warren's plant was scheduled to pay out during 1959, after which producers would get more.

ONG gathered and compressed the gas and took the residue at the plant tail gate with no payment to producers until its investment was returned. There now seems little prospect that ONG's investment will pay out during the life of the field.

There was a flurry of development drilling while the plant was under construction, and about 250 producing wells were drilled. Since then there has been no drilling.

Production . . . Currently Ringwood is producing about 750 bbl. of oil and 14,500 M.c.f. of gas per day—or did until last November when the commission shut the field in for testing (OGJ, Nov. 24, 1958, P. 50). Since then most of the Manning wells are back on production, but not the Cherokee zone.

There is little dispute that Ringwood is a "sorry" field. There was testimony that only about 6 or 7% of oil in place is recoverable by primary methods and that 90% of this has already been recovered.

In 1948 the Commission classified Ringwood as an oil field and set 40-acre spacing. At that time the gas-oil ratio was 850 to 1. It now exceeds 16,000 to 1, and producers predict a ratio of around 23,000 to 1 within a year.

On this basis producers and the OCC's conservation division contend the Manning zone should be classified as a gas field. On the other hand, Warren and ONG contend it's a "textbook" example of a depletion-type oil reservoir, that its performance could easily have been predicted in 1948, and that neither then nor now could it possibly be classified as a gas field.

The arguments . . . Warren says its profit is less than 1 cent per M.c.f., and if the gas price goes up as much as 1 cent it will junk the plant.

ONG says even though it pays nothing at the wellhead, the cost of gathering and compressing makes Ringwood gas the most expensive gas on its system. It offered to pay its state-wide average price (around 10 or 11 cents) for residue gas at the Ringwood plant if relieved of the obligation to gather and compress.

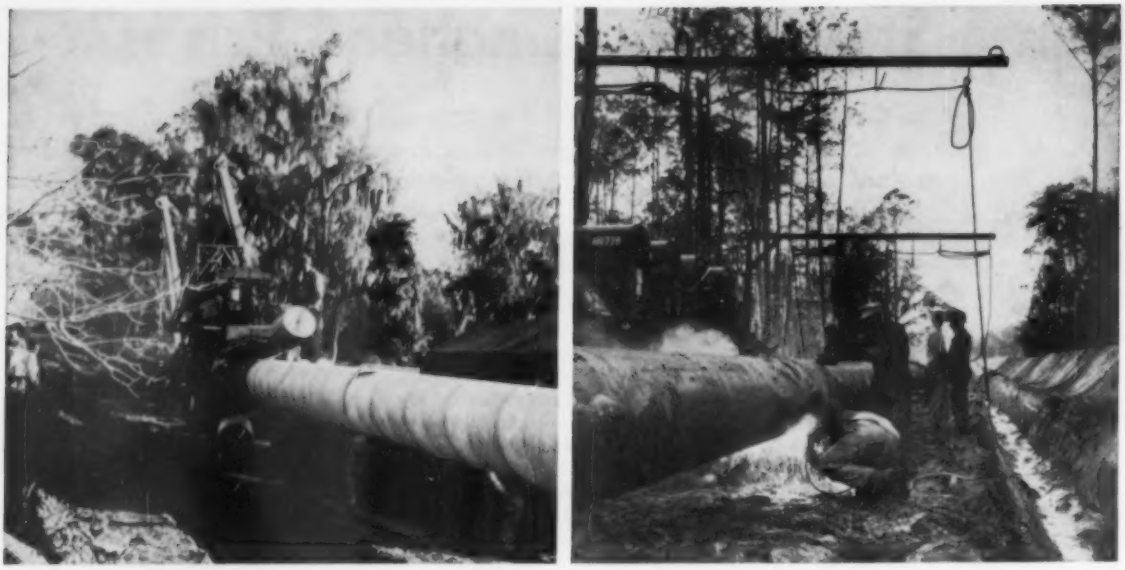
Producers contend that at present returns the field will be abandoned about 1963, leaving much oil and gas in the ground unrecovered. But if the price were 11 cents at the wellhead the field would continue until at least 1973, would recover an additional million barrels of oil and 90,000,000 M.c.f. of gas, and bring producers an additional $15,000,000.

Warren and ONG say that if the price is raised the field will either be abandoned immediately or Oklahoma gas consumers will pay an additional $15,000,000 for the benefit of a few producers and royalty owners in a field that was uneconomic to start with the never should have been developed.

The conservation argument is this: Return to producers is so low that it's uneconomic to do additional development drilling in Ringwood, and much oil and gas will never be recovered. Moreover, production from present wells is draining the undrilled leases, thus violating correlative rights. Therefore, both physical and economic waste are occurring, and they can be corrected only by reclassifying the field and obtaining a higher price.

Ringwood is undoubtedly an extreme case. But Oklahoma has many fields where the wellhead price for raw casinghead gas is much less than the normal contract price for large quantities of dry, high-pressure gas at plant tail gates or dry-gas wells.

So if the forthcoming decision requires payment of the state-wide average price for this poor Ringwood gas at the wellhead, it could set a precedent for far-reaching changes in casinghead-gas contracts.



TWO CONSTRUCTION FEATURES of the Texas-to-Florida gas system are the polyethylene tape used to wrap more than half of the system (left photo) and double jointing the pipe.

Texas-Florida Gas Line Pushes Ahead

• A gas system that many thought would never be built will start moving gas into Florida about June 1. Primary customers will be two utilities which are buying their own gas in Louisiana and Texas.

THE GAS LINE to tropical Florida—scoffed at by experts when proposed 5 years ago—soon will be within sight of its Miami terminus.

The doubters were ready to scratch the project half a dozen times during its rocky course of getting a gas supply, Federal Power Commission approval, and financing. Now they are witnessing the unfolding of a $163,757,300 success story.

This is the initial capital investment by Houston Texas Gas & Oil Corp. and Coastal Transmission Corp., subsidiaries of Houston Corp. The project includes 2,654 miles of trunk lines and laterals between McAllen, Tex., near the Mexican border, and Miami. Coastal is building the line from McAllen to Baton Rouge. Houston Texas is taking the line from Baton Rouge.

The initial phase will not quite be complete before an application is filed with FPC to spend $41 million on additional compressor stations. This would boost the outlay to $205 million.

Some 700 miles of pipe have been put in the ground during 3 months of construction. Completion is scheduled by May 1. On June 1, the 24-in. main line should be ready to move a daily average of 282,000,000 cu. ft., with maximum capacity of 287,000,000 cu. ft. The original system will have eight compressor stations totaling 40,500 hp.

The Florida market, the nation's last major area without natural gas, will justify compressor expansion to boost capacity to 418,000,000 cu. ft. daily by January 1960.

Houston Corp. has purchased manufactured-gas distribution systems in Jacksonville, Orlando, Miami, Lakeland, and Daytona Beach, and small LPG systems in other cities. Some $23 million is budgeted in the next 3 years to expand distribution systems to be converted to natural gas.

Long shot pays off . . . The Florida line, which will spur the industrial boom that helped to make it feasible, had a hectic life during its formative period.

It had a struggle from the time the late J. O. Mack of Houston first declared his intention, in a cryptic newspaper advertisement, to build a pipeline somewhere. Florida became the target when a market survey in 1954 revealed its potential.

F. E. Stanley, Tulsa pipeline contractor and promoter, now president and chairman of Houston, joined the venture in late 1954. Key figures in guiding the project through FPC and defending it up to the Supreme Court against competing fuel interests were Stanley; Theodore Rinehart, Tulsa lawyer, gas expert, and a vice president of Houston; W. J. Bowen, president of Coastal, which was formed by Clint Murchison interests; and O. Paul Herzig, vice president of engineering for Houston.

The FPC granted a conditional certificate in December 1956, but it wasn't until May 1958 that court appeals were finally defeated, clearing the way for financing.

A different pipeline . . . Much of the uphill battle was due to the venture's pioneering nature.

The Florida line is different from others in many respects. First, in the absence of a big residential market, it had to be based mainly on an industial load, a fact which also gives it a high load factor.

Of the initial throughput, 150,000,000 cu. ft. daily will be transported for two customers — Florida Power Corp. and Florida Power & Light Co. —for power generation. These companies purchase gas in the field from Sun Oil Co., Pure Oil Co., Magnolia Petroleum Co., and LaGloria Oil & Gas Corp.

Florida Power pays 20½ cents an M.c.f. for Louisiana gas. Florida Power & Light pays 16½ cents for Texas gas. As no resale is involved, the sale is not subject to FPC regulation.

Gulf Oil Corp., Shell Oil Co., and Superior Oil Co. supply 70% of the remainder of the gas. The resale gas is purchased for 16 to 18 cents in Texas and 18 cents plus gathering tax in Louisiana. Some 2 trillion cubic feet of reserves in 53 fields is dedicated to the line.

Another different aspect of this system is its rate formula. The traditional demand-commodity method was abandoned in favor of more uniform rates over the state, preventing disparities which would have kept gas out of part of Florida.

Construction features . . . Construction has its unique features, too.

The Houston Texas line is the first to be wrapped for its entire length with polyethylene tape for corrosion protection. Company studies and experience show that tape, while costing more than asphalt or coal tar, requires less machinery and labor for application and installation cost is less.

Houston Texas and Coastal both are cutting laying costs by double jointing. Houston is laying 60-ft. joints (two 30-ft. sections welded at the mill) for most of its main line.

One Coastal contractor is double jointing 40-ft. joints in the field (OGJ, Jan. 5, p. 70).

Midwestern - Walco Contractors spreads on the Houston line regularly lay more than 2 miles a day and have laid up to 18,000 ft. (3.4 miles). By using 60-ft. joints, the pipe gang moves ahead 50% farther with each weld than with 40-ft. joints. The long joints, with special techniques to get equipment through swamps, enables spreads to make progress which would be considered good in the dry plains of the Southwest.

Design features . . . In both Houston Texas and Coastal compression stations, all auxiliaries are driven off the compressor engine so there is no dependence on outside power.

In the event of a power failure, only the lights will go out. The station will continue to operate as long as fuel gas is available from the line.

Along the Houston Texas part of the system, supercharged four-cycle engines are used to take advantage of the lowest possible fuel consumption. These engines are direct connected to horizontal pancake compressors. Coastal is installing conventional two-cycle, angle-type compressor units.

watching WASHINGTON

Joe Reilly

• Gas-price drama moves back to Supreme Court

IF CONGRESS DOESN'T DO SOMETHING pretty soon to remove or clarify price controls affecting independent gas producers, the courts may go into the rate-fixing business in a big way.

By a split decision in the 1954 Phillips case, the Supreme Court gave the Federal Power Commission the task of regulating the price of gas destined for interstate commerce. The court now has before it two cases in which lower tribunals disagreed on how the FPC should accomplish its task.

Outcome of the cases may set a pattern for future price controls. It could inspire Congress to change the law.

In the two cases now before the Supreme Court, the FPC was challenged for its failure to set specific rates which producers could get for their gas (OGJ, Jan. 19, p. 70).

A SIMILAR CASE, recently filed in the Third Circuit Court of Appeals at Philadelphia, also may be destined for the Supreme Court. In it, the FPC is accused of failure to determine the reasonableness of rates to be paid to 26 producers.

The Philadelphia case involves gas bought by Transcontinental Gas Pipe Line Corp. in southern Louisiana and the offshore area. The record-setting prices range up to 23.3 cents per M.c.f.

In allowing the prices to become effective, the FPC rejected a recommendation by its staff that the rate be set at 17 cents. That, according to the staff, was the going rate in South Louisiana. Gas wasn't available at the going rate, though.

The case involves some 2 trillion cubic feet of gas. After contracting for the new supply, Transco received FPC authority last September to proceed with a $167,000,000 expansion program. If the permit had been held up, some of Transco's customers on the Atlantic Seaboard would have faced a gas shortage this winter.

IN RULING ON THE CASES NOW BEFORE IT, the Supreme Court may set a formula for determining whether proposed rates are "just and reasonable." Some guidance would be welcomed by the FPC, if it must continue setting wellhead prices.

Since the Phillips decision, FPC has acted on more than 35,000 rate filings. At the end of 1958, more than 2,000 rate increases were still pending. During the same period, more than 10,000 gas certificate applications were filed. At the end of the year, 2,000 of them were pending, too.

Regardless how much scrutiny an application receives, the FPC's ruling is subject to conflicting decisions by a dozen different courts.

The Supreme Court may make matters worse. But, on the other hand, it could simplify matters a great deal.

The present court is not the same one that ruled in 1954 that an independent producer was subject to federal price controls. Only three justices who voted for the Phillips decision are now on the court. Still serving are two of the three men who dissented in the Phillips case.

Of the four new men on the court, none of them joined Warren, Black, and Douglas last month in their minority argument seeking to uphold the Memphis decision. One of this trio—Douglas—had supported the industry view in the Phillips case.

There are indications the Warren-led "liberals" may find themselves more and more on the minority side in questions dealing with government regulation of private industry. The high court could solve a lot of producer problems when it acts on the gas cases now before it. Maybe it's too much to hope for, but it's an interesting thought, anyway.

New Price Cuts Nick Producer Income

• Oil men are receiving $94,718 per day less for their crude now than 3 months ago and $800,000 daily less than 16 months ago. Latest cuts aren't as severe as those in mid-1958 but are just as confusing.

NEW PRICES being posted in West Texas and New Mexico give oil producers the feeling they're seeing a bad movie a second time.

Since the first of the year purchasers in that region have posted cuts ranging from 7 to 15 cents a barrel on 401,300 bbl. daily out of a 1,500,000 bbl. daily output.

Loss to producers in that period is estimated at about $31,000 daily.

The loss also stands to grow if buyers of the remaining three-fourths of the region's crude decide to make similar adjustments.

Vicious circle . . . What worries oil men is failure of crude prices to maintain a competitive balance.

Prices are riding a spiral steadily downward.

The current price cuts in West Texas and New Mexico, for example, have been described as necessary to make the crudes competitive with crudes on the Gulf Coast and in Oklahoma and Kansas.

Earlier, crudes in Oklahoma and Kansas and in various spots on the gulf eased downward because of price adjustments in North Texas, the Rockies, and Arkansas and Louisiana.

And on the spiral goes. When one area gets lower prices, another follows, and this sets off a chain reaction in still other areas.

More confusion . . . The chain-reaction trend downward is not the only confusing aspect of new price postings.

Companies lately haven't been able to agree on the value of crudes from the same geographical area. Several different schedules have become a reality in Oklahoma and Kansas. The same trend is developing in the West Texas-New Mexico areas.

In Kansas, for instance, four different top prices are being paid for sweet crude: $2.98, $3.00, $3.05, and $3.08 a barrel. In this situation 197,300 bbl. daily is sold at $3.05, another 128,700 bbl. at $3.08, and only minor amounts at the other postings.

Even so, there are two different schedules topping at $3.05. One applies a 3-cent differential for each degree of gravity downward from 40° to 36° and a 4-cent differential for each degree lower than that. The other applies a 2-cent differential between 36° to 40°, a 3-cent penalty from 31° to 36°, and a 4-cent penalty for gravities below 31°.

A similar situation prevails for Oklahoma sweet crude. About 228,500 bbl. daily moves at a $3.08 top and 168,000 bbl. daily at $3.05. But because of varying differentials downward, six different schedules actually prevail.

The current postings in West Texas and New Mexico also are carrying a new 3-cent differential downward on the sour crudes. The trend was established by Shell in a 7-cent cut met by two other purchasers. In all, seven buyers so far have reduced the West Texas-New Mexico prices on both sour and sweet crudes.

A look back . . . In the last 16 months, studies made by The Oil and Gas Journal indicate producers have lost $807,718 daily income through price cuts involving 5,487,200 bbl. daily.

During this time, some crudes have sustained two price cuts. Also in estimating reduced producer income, full weight was not given the income lost through restrictions on production.

This has been the price trend:

. . . From October 1957 through April 1958 about 1,945,000 bbl. daily of domestic crude sustained average price cuts of 13.1 cents a barrel. This was 29.1% of the nation's production at the time and represented a loss

A New Industry Puzzle: What's the Price

ANY SEMBLANCE of price uniformity has gone out the window for Oklahoma oil producers.

Sweet crude, as the table shows, is being purchased on two basic schedules topping at $3.05 and $3.08 with a 2-cent per barrel drop for each degree of gravity from 40° to 36°.

But from there on the schedules split six ways.

Take the schedules topping at $3.05 a barrel for 40° gravity. One keeps the 2-cent downward differential. A second puts a 3-cent penalty on each degree of lower gravity, and a third imposes a 4-cent penalty. The fourth schedule has a 3-cent penalty from 35° to 31° and a 4-cent penalty from 30° down.

The table shows the postings by companies and the amount of crude each company purchases in Oklahoma.

Anderson Prich.	11,000	**C.R.A.**	11,000	**Magnolia**	13,000
Champlin	23,000			**Sohio**	7,000
Kerr-McGee	45,000				
Midland Co-op	5,000				

40°	3.05	3.05	3.05
39°	3.03	3.03	3.03
38°	3.01	3.01	3.01
37°	2.99	2.99	2.99
36°	2.97	2.97	2.97
35°	2.94	2.93	2.95
34°	2.91	2.89	2.93
33°	2.88	2.85	2.91
32°	2.85	2.81	2.89
31°	2.82	2.77	2.87
30°	2.79	2.73	2.85
29°	2.76	2.69	2.83
28°	2.73	2.65	2.81
27°	2.70	2.61	2.79
26°	2.67	2.57	2.77

Price Changes—and Their Effect*

	Average Price Change (cents)	Volume Changed (bbl. daily)	Producers' Income Change ($ per day)
DECREASES			
Oklahoma (sweet)	8.38	212,800	17,822
Kansas	9.21	343,600	31,644
Arkansas	10.30	56,500	5,825
North Louisiana	8.37	15,450	1,293
Alabama-Mississippi	9.39	22,000	2,065
South Louisiana	15.00	4,500	675
Texas—Gulf and South	9.62	78,100	7,510
North Texas (net)	3.48	14,900	518
West Texas (sour)	7.96	167,000	13,290
West Texas (sweet)	7.00	149,300	10,451
New Mexico (sour)	8.61	74,500	6,415
New Mexico (sweet)	7.00	10,500	735
Rocky Mountain†	10.49	132,900	13,945
	8.75	1,282,050	112,188
INCREASES			
Oklahoma	5.73	199,000	11,410
Kansas	4.00	39,000	1,560
Pennsylvania Grade	15.00	30,000	4,500
	6.52	268,000	17,470
Net daily loss to producers			94,718

*Changes between October 14 and January 22.
†Includes North Dakota, Colorado, Nebraska, and Wyoming.

of income totaling about $250,000 daily (OGJ, Apr. 28, p. 53).

... From May 1958 through October 1958, price cuts averaged 20.51 cents a barrel on 2,260,470 bbl. daily. Reduced cash income to producers was estimated at $463,000 daily (OGJ, Oct. 20, p. 47).

... From November 1958 to mid-January 1959, price cuts have averaged 8.75 cents on 1,282,050 bbl. daily for an income loss of $112,188 daily.

A few upward adjustments were made in this period on Oklahoma and Kansas sweet crudes and on Pennsylvania-grade crudes which added $17,470 daily to producer income and cut the loss to $94,718.

The result since last November is that the nation's total average crude price has been further lowered 1⅓ cents per barrel.

Major losses were in Oklahoma, Kansas, West Texas, and the Rocky Mountain region.

# of Oklahoma's Sweet Crude?

Sinclair	40,000	Cities Ser.	28,000	Sunray	115,000
Rock Is.	7,000	Conoco	13,500	Bigheart	3,500
Pure	6,000	Indiana Pur.	28,000		
		Sohio	8,000		
		Phillips	23,000		
		Shell	8,500		
3.05		3.08		3.08	
3.03		3.06		3.06	
3.01		3.04		3.04	
2.99		3.02		3.02	
2.97		3.00		3.00	
2.94		2.98		2.97	
2.91		2.96		2.94	
2.88		2.94		2.91	
2.85		2.92		2.88	
2.82		2.90		2.85	
2.78		2.88		2.82	
2.74		2.86		2.79	
2.70		2.84		2.76	
2.66		2.82		2.73	
2.62		2.80		2.70	

Ratable-Take Fight

in Texas centers around sale of gas from 5-acre lease.

THE TEXAS Railroad Commission took final testimony in Austin last week in the first hearing seeking ratable take of gas since the U. S. Supreme Court affirmed the commission's authority in this field last year in the now-famous Puckett field case.

W. A. Moncrief, Jr., seeks a ruling forcing the pipeline serving the field to take gas ratably from all wells in Emperor field according to the field allocation formula.

The application applied to purchases of gas from both the Devonian and Ellenburger reservoirs in the field by West Texas Gathering Co.

Moncrief has one well in the field completed on a 5-acre tract under Texas' embattled Rule 37 exception to normal field spacing. The well was completed in December for an open-flow potential of 170,000,000 cu. ft. daily in the Devonian and 28,000,000 cu. ft. daily in the Ellenburger.

The allocation formula in the field is based two-thirds on acreage, one-third on the well.

Moncrief attorneys testified that West Texas Gathering had offered a purchase contract for gas from this well based essentially 100% on surface acreage.

Opposition . . . Fred Young, commission examiner, barred Moncrief opponents from testifying as to drainage which would result from adjacent leases if the application were approved. He did so on the basis that such testimony would be a rehashing of the allocation formula for the field on which the commission already had ruled.

Opposing the application were other Emperor operators including: Pan American Petroleum Co., Humble Oil & Refining Co., Phillips Petroleum Co., Sun Oil Co., Shell Oil Co., and Continental Oil Co. West Texas Gathering and El Paso Natural Gas Co. also asked that the application be denied.

New Texas Laws Urged

. . . by study group to halt "anticompetitive practices" of majors. Bills would tighten up buying, gathering rules.

TEXAS may soon use state legislation to strike an indirect blow at oil imports by tightening up conservation and antitrust laws.

This was recommended to Gov. Price Daniel by an oil-imports study commission appointed more than a year ago. In its final report January 16 the commission said that "excessive imports have encouraged anticompetitive practices by importing companies and their affiliates."

It urged that legislation to wipe out these practices be submitted to the state legislature at regular session now under way. Such legislation would:

. . . **Forbid any common carrier** to abandon, sell, or otherwise transfer gathering systems except by permission of the Texas Railroad Commission or with consent of all connected well owners.

. . . **Compel common purchasers** and their common-carrier affiliates to make reasonable extensions of their gathering systems to new fields and to take ratably all along their systems.

. . . **Rewrite discrimination law,** which now prohibits discrimination by a common purchaser or common carrier among producers in a field, to also prevent discrimination between fields in the state. "Common purchaser" also should be redefined to include any truck or pipeline gathering system which purchases for resale.

. . . **Clarify legislative intent** to confer on the Railroad Commission all necessary authority to exercise full regulatory power over all who gather crude in Texas.

. . . **Clearly empower commission** to require "reasonable extensions, reasonable connections, and ratable purchases," and provide penalties for violation.

. . . **Broaden antitrust laws** to define as conspiracy in restraint of trade any agreement between a purchaser and a pipeline subsidiary to boycott or threaten to discontinue buying from or transporting for a producer for purpose of favoring the company's own production or that of an affiliate.

Practices flayed . . . The study commission said that Texas' law covering production, transportation, and purchasing of oil had not been materially changed since 1932.

Since then there have been great changes in oil marketing and transportation practices. For instance, trucking, practically unknown in 1932, "has become a great factor in oil transportation."

The recommended changes should bring the Texas laws up to date, the commission said, and eliminate anticompetitive practices by importing companies and affiliates.

It listed these practices as:

. . . **Cutting prices** for domestic oil unjustifiably.

. . . **Prorating purchases** in fields where the purchaser has no significant production of its own in apparent disregard of state allowables and intent of state laws.

. . . **Failing to expand** into new fields and to extend pipeline connections to new wells.

. . . **Selling gathering systems** to avoid effects of common-purchaser statutes.

. . . **Disconnecting wells** or fields where purchasers have no producing interests, thus favoring those fields where they do have such interests.

. . . **Forcing producers** to use purchaser-designated trucking concerns to secure a market for trucked oil.

"This practice implies a high degree of control, if not actual corporate connection, between the gathering concern and the purchaser. In almost all cases, truckers are not regulated under either common-carrier or common-purchaser statutes. An increasing number, however, are taking title to the oil at the lease and reselling it to purchasers at delivery points."

The remedial legislation was recommended specifically by the study commission's legislative subcommittee. Members of this subcommittee are Guy Warren, Corpus Christi, chairman; Bruce Street, Graham, vice chairman; Earle B. Mayfield, Jr., Dallas; Charles K. Devall, Kilgore; T. H. Riggs, Houston; and French Robertson, Abilene, chairman of the study commission.

Other members of the commission include Dr. John Stockton, University of Texas, Austin; M. P. Connally, Baytown; Berl E. Godfrey, Fort Worth; Lawrence Hagy, Amarillo; and John R. Lee, Kermit.

TIPRO approves . . . Eugene Locke, president of the Texas Independent Producers and Royalty Owners Association, praised the study commission as having ably fulfilled "a truly momentous public responsibility."

Texas' present conservation laws, passed more than a generation ago, "gave us world leadership in oil production and conservation," Locke said. "Marketing practices have changed so radically in the last few years that we must now reinforce these laws to encompass present conditions, or we stand to lose the great domestic industry they made possible."

The commission, he said, heard testimony from the Railroad Commission, other state and federal officials, independent producers and refiners in Texas and other states, and local businessmen.

PIPELINE BRIEFS . . .

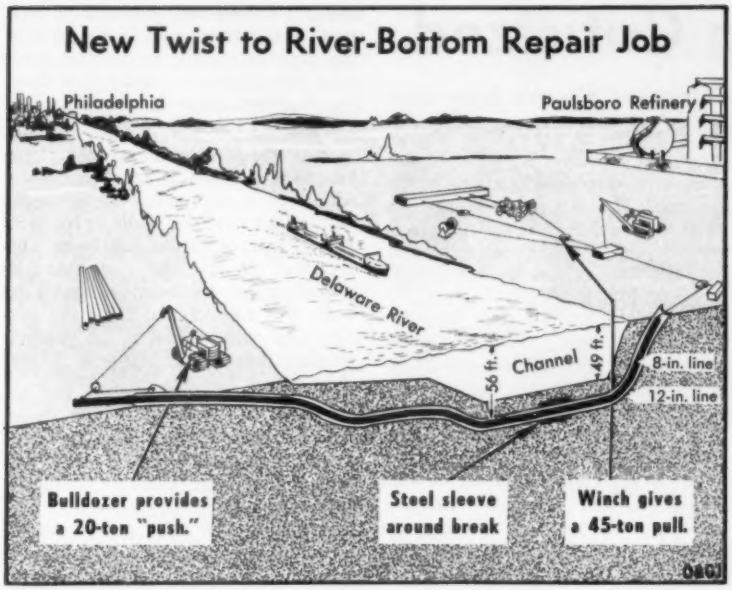
An estimated $30,200,000 in construction for 1959 is planned by Lone Star Gas Co. in Texas and Oklahoma. Lone Star will spend $25,700,000 for new construction and $4,500,000 for modernization and expansion of existing facilities.

A new plan to expand gas service in the Middle West has been filed with the FPC by Northern Natural. In two applications, the company seeks to serve an additional 326 communities in six states. Daily capacity of the system would be increased by 217,000 M.c.f. over a 3-year period at a cost of $101,000,000.

Construction of 438 miles of main-line extension and loop and 1,906 miles of branch lines is planned. Gas reserves would come from the Southwest. FPC previously denied a plan to serve 208 of these communities on grounds that Northern's Redfield, Iowa, underground storage area was not sufficiently proven.

FPC approval for a $48.7-million expansion has been received by Michigan Wisconsin Pipe Line. Temporary authority was granted to lay 373 miles of 24-in. main-line loop, 21 miles of 16-in. loop, and to install 29,210 hp. of compression. Additional capacity will permit Michigan Wisconsin to increase its take from Laverne field, northwestern Oklahoma, from 40,000,000 to 80,000,000 cu. ft. daily. Completion is planned July 1.

Main-line construction totaling 69 miles is planned by Peoples Natural Gas Co., in Pennsylvania. The company will lay 25 miles of 24-in. from



Underwater Gamble Pays Off

. . . with unique solution to river-crossing pipeline break: Floating 8-in. pipe through 12-in. line in a sea of oil.

SOCONY MOBIL Oil Co. has licked a vexing problem by adding an innovation to an old technique.

The company was confronted with a broken 12-in. pipeline at the bottom of the Delaware River. A freighter's dragging anchor had snagged and ripped the line—one of three connecting the Paulsboro, N. J., refinery to the south edge of the Philadelphia International airport.

The damaged line couldn't be lifted out for repairs because it was yoked to the two other lines. A diver fastened a steel sleeve around the break, making the line watertight but still useless for normal, high-pressure operation.

It was decided to run a new 8-in. pipe through the 12-in. line—not a new technique but it presented additional problems in this case. This was a 6,300-ft. underwater crossing, with bends in the line. The engineers had to figure out how to get enough traction to pull the 8-in. pipe, weighing 29 lb. per foot, through more than a mile of 12-in. line.

Stanley Kleinheksel, assistant chief engineer of the company's eastern pipelines division at Plainfield, N. J., came up with the solution: Float the smaller pipe through the larger line in oil.

The company took a chance—and it worked.

How it was done . . . First, compressed air was used to blow a spool-shaped scraper—with a slender steel cable attached—through the line. A device was designed and built to feed the cable into the pipeline without letting the air escape.

Then a larger cable was tied to the smaller one and pulled through. It was used to pull a still larger cable —1½ in. thick—through the pipe. The big cable was fastened to a nose cone welded on the 8-in. pipe.

Heavy fuel oil was then pumped into the old line to lubricate and buoy up the 8-in. pipe.

A diesel-powered winch gave a 45-ton pull on the cable on the Paulsboro side, and the 8-in. pipe nosed into the 12-in. line. Operations were temporarily halted for repairs when the pipe hit a sharp bend and the pulling cable snapped at the winch.

When the operation resumed, a bulldozer was brought in to give an extra 20 tons of "push" from the Philadelphia side.

The small pipe then slid through the larger line without another hitch.

Waynesburg to Garrison, 30 miles of 20-in. from Bentleyville to Imperial, and 14 miles of 12-in. from Johnstown to Seven Springs. A 1,000-hp. compressor unit will be installed on a field gathering line in Greene County. All construction will be complete by September 1.

Hearings are under way on 200-mile 34-in. line which Southern California Gas Co. and Southern Counties Gas Co. plan from the state border near Las Vegas, Nev., to Placentia, near Los Angeles. It would connect with an El Paso Natural Gas Co. line at Las Vegas bringing gas from Oklahoma and Texas.

Approval for a 296-mile line is being sought from the California Public Utilities Commission by Pacific Gas & Electric Co. This is the California section of a 1,300-mile line planned from Alberta to San Francisco, for which approval is being sought from Canadian and U. S. regulatory authorities.

Tariffs have been filed by Valley Pipe Line Co., Ltd., applying to crude oil and natural gasoline from Turner Valley to Calgary. The rate per barrel for gathering and delivering crude to Valley's terminal at Turner Valley and to the Anglo American plant at Hartnell is 14 cents. The tariff for gasoline and crude from the Valley terminal to Calgary is 6 cents. For gasoline from the British American plant at Longview and from Anglo American at Hartnell to the Turner Valley terminal, tariff is 8 cents.

The top 1958 safety award of the Pipe Line Contractors Association went to G. A. Reutzel, superintendent of H. C. Price Co.'s spread one. Reutzel supervised 426,801 man hours without a single lost-time accident from January 1 through October 31.

Also for Pipeliners . . .

IN THE NEWS: Big question in Oklahoma Ringwood hearings: Can state set casinghead prices? (p. 99) . . . Texas-Florida gas line within sight of Miami terminus (p. 100) . . . Pipeliners see hint of new federal fees in President's message (p. 108) . . . Timcoat has completed New Orleans plant for large-scale pipe coating (p. 110) . . . Pipeline under Mediterranean talked to move Sahara gas to Europe (p. 114) . . .

PLUS THIS TECHNICAL REPORT: Pipeline construction (p. 228).

Wide Spacing Criticized

. . . by Texas commissioner. Culberson dissents from new 160-acre order for Dune, defends small-tract drilling.

THERE is disagreement within the Texas Railroad Commission over wide spacing.

Olin Culberson, one of the commission's three members, has filed a rare dissent from the agency's formal approval of 160-acre proration units (in effect 160-acre spacing) in Dune Wolfcamp field in West Texas.

Dune is the second Texas oil pool in history to be granted such wide spacing. The first was Spraberry Trend Area field several years ago.

In criticizing the Dune order, Culberson took sharp issue with wide-spacing advocates and vigorously defended drilling on small tracts.

No such small tracts exist in Dune field. But, said Culberson, the Dune order will open the door to more aggravated situations. It can and will be used, he said, "by large operators as the vehicle to freeze out the owner of the small tract who does not see fit to yield to high pressure to unitize his property."

"I greatly fear that this radical departure from long-established commission policy is unduly influenced by the recently developed intensive campaign . . . of self-appointed leaders of the industry to achieve greater emphasis on acreage and less on the well."

This, he said, would "promote monopoly, reduce drilling incentive, unfairly punish the royalty owners, penalize state revenues, and ultimately operate to cripple a healthy and orderly development of Texas oil reserves."

More drilling needed . . . Culberson said he was well aware of the present "hue and cry for wider spacing with a possible reduction of per-unit production costs."

He feels, however, that "the interests of this state and nation would best be served by more, rather than less, drilling."

The fact that everyone would like to see a higher percentage of wildcats drilled, he said, is no justification for a regulatory system to "penalize development drilling"—especially when such wells are needed to preserve equities and prevent monopoly.

Culberson also attacked the majority decision to set up well-spacing rules for 40 acres while fixing 160-acre proration units.

This, he said, would permit an operator to develop to a greater density than one well to each standard proration unit. The difference in size between the spacing unit and the proration unit will, he said, encourage the very evil the commission has sought to avoid.

The majority view . . . The commission followed the recommendation of its chief engineer and of the commission examiner which heard the evidence in its decision in the Dune case.

Hearing on rules for the field was called by the commission on its own motion and held December 10. Evidence in favor of wide spacing was based primarily on pressure and permeability data and interference tests. There was no opposition.

Dune field was discovered by Gulf Oil Corp. in April 1957. It now has 12 flowing wells producing from the Wolfcamp at 7,710-60 ft. and about 1,600 developed acres. The existing wells are on 80 and 160-acre spacing.

Operators testified that bottom-hole pressure originally in the field was 3,488 psi., porosity averages 9.4%, and permeability is 370 md.

Evidence was presented to show that the bottom-hole pressure of each new well completed in the field is the same as the current average pressure throughout the field—thus proving excellent communication.

Pressures of the sixth, seventh, eighth, and ninth wells as completed ranged from 2,591 to 2,600 psi. Meanwhile, pressures taken on the same data of the first five wells in the field ranged from 2,591 to 2,607 psi. This occurred despite the fact that the minimum distance between any of the wells was 1,867 ft. and that the first five had each produced oil volumes ranging between 22,000 and 73,000 bbl.

Interference test . . . Results of an interference test last June bore out the previous pressure findings, field operators said.

In this test all wells in the reservoir were shut in to obtain a maximum bottom-hole pressure reading for each. One well then was allowed to produce for a period of 16 days while the others were shut in. Allowables of shut-in wells were transferred to the test producer.

The well produced 10,264 bbl. of oil during the period with no water or increase in gas-oil ratio.

At the end of the period, bottom-hole pressure readings were again taken in all the involved wells. The shut-in wells showed unanimous pres-

Says Ernest Thompson:

Close spacing is your fault

THE OIL OPERATOR, not the regulatory body, should be the target of any criticism of the narrow well-spacing practices in the industry, according to Texas' Gen. Ernest O. Thompson.

Thompson, chairman of the Railroad Commission, is considered a friend of wide-spacing advocates, but he made it clear last week that the operator himself must carry a share of the burden.

"I don't think it is fair in this new drive for wider spacing to point the finger of scorn at regulatory bodies when it is the operators who drilled the wells," he said.

Thompson spoke before the Gulf Coast section of the Society of Petroleum Engineers, AIME.

"Broader spacing of wells can be achieved," he said, "if the operators will set the pattern of spacing when the discovery is made. When the new field has been discovered, and at least five wells drilled, then a hearing can be had at which time the operators will be required to show interference and prove efficient, adequate drainage. But it is not proper to drill a cluster of wells and then expect the commission to extend the spacing out from this cluster of wells around the discovery."

Thompson also made the point that courts have held that, in Texas, the operator of any undivided tract, no matter how small, must be allowed to drill at least one well and receive an allowable that will make the well profitable.

The Railroad Commission has received pressure recently from some independents and majors to order wider spacing to cut drilling costs and prevent waste.

sure drops ranging from 37 to 43 psi. and averaging 41 psi.

Engineering evidence, operators said, indicated that one well in the Dune Wolfcamp field would be capable of draining much more than 160 acres—in fact more than 1,300 acres —without producing water or solution gas in excess of 500:1.

Commissioners E. O. Thompson and William Murray, Jr., based their majority decision on this evidence. Culberson called the evidence "meager, but uncontroverted."

"I have very serious reservations," Culberson said, "as to the ability of the finest engineers, even utilizing the tremendous technological advances now being made in the geological field, to estimate with 50% accuracy the amount of oil that may be reasonably produced from a proposed well.

"Despite the strides of science . . . the only truly accurate means of determining the amount of oil underlying any part of the earth's surface is the drill bit."

Another test . . . The commission is expected to rule soon on still another wide-spacing application in West Perryton field in the Panhandle.

Here, Sun Oil Co. is asking 160-acre spacing plus 100% acreage allocation. Allocation based primarily or entirely on acreage was strongly opposed by Culberson in his Dune field dissent.

Sun was backed in its application at a December hearing by Humble Oil & Refining Co. and Sunray Mid-Continent Oil Co. The application went unopposed (OGJ, Dec. 29, 1958, p. 76).

CONTAMINANTS are removed while airship is being loaded as . . .

New Filter Dewaters Jet Fuels

A NEW FILTER capable of reducing water to 10 to 15 parts per million is now in airfield use, dewatering jet fuels.

Its further ability to remove solid contaminants down to one-half micron in size may extend its use on other petroleum products and intermediate streams in refineries.

The Air Force has ordered eight of these 600-gal. per minute Perma-Dry units from Permanent Filter Corp. of Los Angeles. California refiners and aircraft companies have been testing the units for some time.

How it works . . . The new unit traps water and solid contaminants by a series of special filters. The first trap is a synthetic fabric which removes large particles. Next stage is a bonded porous bronze filter which removes particles down to 10 microns. The matrix pattern causes the groups of minute water droplets to become larger drops.

Carrying these larger drops, the fuel now passes through a fiber-glass unit. This forces large drops to combine and become globules large enough to settle out into emptying trays.

Possible use in refineries covers removal of water and contaminants from gasoline, gas oil, and lube stocks after caustic or acid treating. It is also hoped the new filter may be able to remove metals and other impurities from catalytic cracker feedstocks to reduce catalyst poisoning.

the JOURNAL *said . . .*

50 years ago

January 20, 1909

A rotary drilling outfit has been shipped from Beaumont by the Southern Well Works Co. to Aguascalientes, Mexico, for a wildcat test. Behind the project are Carlos Morfin, Antonio Vargas, and Bruno Newman of Aguascalientes.

Two wild blizzards hit the Mid-Continent oil region in January, resulting in a heavy decline in production and suspension of rig building.

Eddy & Gunn Rice Co. drilled a 425-ft. artesian water well 6 miles north of Sulphur, La. On New Years Day, the well blew out through 10-in. casing from a 325-ft. sand. The Meathers Oil Co., with 800 acres under lease near the water well, will drill for oil.

25 years ago

January 25, 1934

Gas flow of 1 million feet a day is found in Lloydminster Gas Co.'s wildcat in Western Saskatchewan at 1,390 ft.

Shipments of 400,000 bbls. of oil are being made from Los Angeles in Japanese-flag tankers for Japan for use of the Imperial Japanese navy.

A 300-ft. strip in Arkansas bordering the state lines of Missouri, Oklahoma, Texas, and Louisiana today became a "no man's land" in gasoline tax matters. Gov. Futrell of Arkansas signed a bill providing gasoline may be sold by stations in the zone at the same rate of taxation existing in adjoining states. Arkansas has a 6-cent a gallon tax rate.

10 years ago

January 27, 1949.

P. C. Spencer is named president of Sinclair Oil Corp., as founder Harry F. Sinclair becomes chairman of the board of directors.

Death sentence given Dr. Simon Papp, former manager of the Hungarian affiliate of Standard Oil Co. (N. J.) on charges of economic sabotage, has been reduced to life imprisonment by the Hungarian supreme court.

U. S. crude output in 1948 totaled 2,051,433,000 bbls., averaging 5,605,000 daily for a 10.2% increase over 1947. Foreign production averaged 3,775,000 bbls. daily, an 18.1% increase. An all-time record of 39,778 wells were completed in 1948.

Gas Woes Will Grow

. . . if Ike's budget message is followed. New FPC charge is suggested, but nothing said about a new gas bill.

NATURAL-GAS producers and transmission companies both found some bad news in President Eisenhower's budget message last week.

Producers were disappointed chiefly in what the message didn't say. The President's failure to ask specifically for another gas bill to free independent producers of utility-type price controls virtually wiped out already-dwindling hopes for such legislation this year.

But another proposal, this one plainly stated in the budget, threatens both producers and pipelines with an unexpected financial burden.

If adopted, it would impose fees on natural-gas companies, making them pay for the privilege of being regulated. Cost to the producers and pipeline companies would amount to about $3,747,100 for the 1960 fiscal year beginning next July 1. That's the share of the Federal Power Commission's $7,425,000 budget that is allotted to natural-gas activities.

The President didn't spell out the type or size of fees to be sought. His proposed budget, covering more than 1,000 pages, had this one-sentence reference to the unpublicized plan:

"Legislation will be proposed to collect fees from the natural-gas and electric power industries to reimburse the Government for the cost of administering the Natural Gas Act and for a portion of similar costs related to the Federal Power Act."

The FPC already collects license fees for nonfederal hydroelectric projects under its control. Such fees will total about $2,000,000 this year.

A government spokesman said the FPC had never recommended to Congress that fees be levied on applications for natural-gas certificates. Proposed fees were drawn up several years ago at the suggestion of the budget bureau, but they were not adopted.

Cost of administering the Natural Gas Act has risen sharply in recent years, largely as a result of the Supreme Court decision in the Phillips case. The ruling brought about 10,000 independent producers under federal price controls.

Natural-gas activities now account for more than half of the FPC budget.

More taxes asked . . . As had been forecast, Eisenhower also proposed new taxes on motor fuels, aviation gasoline, and jet fuel. His proposals would bring the total federal levy to 4½ cents per gallon in each case.

The President's plan calls for an increase of 1½ cents per gallon for motor fuel, 2½ cents on aviation gasoline, and a completely new tax of 4½ cents on jet fuels.

Protests immediately centered on the proposed 50% increase in motor-fuel taxes, which would be earmarked for the federal highway program. Sen. Pat McNamara (D-Mich.), member of the public-works committee, termed the proposal "completely unreasonable."

Other major tax recommendations call for another 1-year extension of the present rates on corporation profits and continuation of excise taxes which were to expire next June 30.

Other proposals . . . Holders of federal oil and gas leases will get special attention in a later recommendation. Details of the new lease policy were not announced, but it apparently would increase the cost of many federal leases.

"In accordance with this administration's policy to obtain a fair return for use of federally owned resources," Eisenhower said, "legislation will be proposed to revise the fee schedule for noncompetitive oil and gas leases on lands in the public domain."

Eisenhower revived the plan for a major helium-conservation program. The Interior Department sought legislation from the last Congress to authorize construction of 12 helium extraction plants, to be built either by the Government or private industry.

The President indicated the emphasis this year will be on "private participation and financing."

Michigan Discoveries Add Zest

. . . to exploration program in southern part of state. Two new wells spot a 12-mile trend northwest of Scipio field.

TWO WILDCAT discoveries promise to step up activity in already-busy southern Michigan.

The first was brought in in December 12 miles northwest of Scipio. It was immediately acclaimed the most important Michigan discovery in 1958.

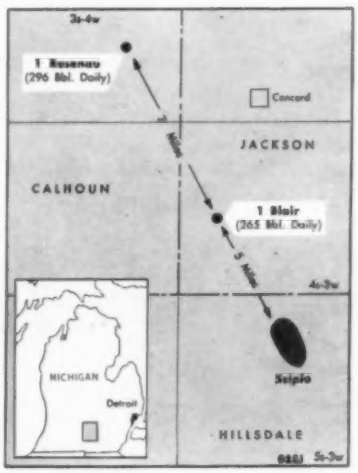
Last week another important strike was brought in—roughly half way between the December discovery and Scipio. It marked a 12-mile trend running northwest from the northern tip of Scipio field.

Both the new discoveries produce from the Trenton—the pay zone in Scipio.

Adding to enthusiasm in the area is the fact that Aurora Gasoline Co., chief operator in Scipio, is now studying plans for a 70-mile crude line to Detroit, where it has a 44,000-bbl. refinery.

New discoveries . . . The newest link in the pay trend is Turner Petroleum Corp.'s 1 Blair, 5 miles northwest of Scipio in Jackson County.

The Blair flowed 265 bbl. of oil daily on 10/64-in. choke from Trenton dolomite at 3,832 ft. Five-inch casing was set 155 ft. in the pay zone. After running tubing, the well flowed 100 bbl. of 42.1°-gravity oil in 5 hours on 20/64-in. choke. Gas-oil ratio is 1,400:1.



Last month, Thomas Mask and McClure Oil Co. found Trenton pay in the 1 Rosenau, 12 miles northwest of Scipio. This well, in Calhoun County, flowed 296 bbl. per day natural on 26/64-in. choke. Besides the operators, Carter Oil Co. and Aurora have offset acreage.

New exploratory drilling is expected along the new northwest-southeast trend. Carter and Sun Oil Co. are the two most active majors in the area. But Aurora has the biggest spread, with well over 500,000 acres, and is

busy making farmout arrangements.

Scipio field . . . Aurora and McClure opened Scipio oil pay in January 1957. Since then 20 producers have been drilled.

Nearest Trenton oil was 40 miles northeast in the now-abandoned Freedom field. Other small fields in that area have produced some oil from the Trenton, which has long been a good source of gas in surrounding states and Canada.

Recovery at Scipio has been rated at a minimum of 10,000 to 12,000 bbl. per acre. Allowable is about 150 bbl. per well daily. Spacing pattern is 20 acres.

Aurora, which operates a 44,000-bbl. refinery at Detroit, will make engineering studies for the proposed crude line from Scipio. Such a line would further stimulate drilling in the area.

Louisiana Leasing Scheduled

LOUISIANA next month will offer 19 tracts—43 of them offshore—at its first lease sale since last July.

The offshore tracts will be the first offered offshore in nearly 3 years. They are located in Zone 1, within 3 miles of shore. The board last week had not added up the acreage involved in the sale, but estimates ran between 200,000 and 300,000 acres. The offshore total is 120,000 acres or more.

The sale will be held February 19 in Baton Rouge.

The Zone 1 acreage is controlled fully by Louisiana under an agreement with the federal Government. The last offshore leasing occurred in April, 1956.

Big Salvage Job Tackled

. . . to put burned-out offshore platform back in service; platform is rebuilt, one well completed, and one working.

CONTINENTAL OIL Co. is making headway in the monumental job of restoring production on the ill-fated CATC 45-E platform off Louisiana.

The seven-well platform was almost destroyed in a costly explosion last October.

Actually the only completion so far is a relief well drilled to help kill the wild wells. Only one of the original seven platform wells is now being reworked.

But Continental already has rebuilt the platform, located in Block 30 field in the West Delta area about 25 miles southeast of Grand Isle.

Continental first had to remove the remains of all three of the platform's decks and the template around the drilling area. It then replaced the drilling and auxiliary decks and built a walkway connecting them instead of building a new intermediate deck.

The relief wells . . . The well drilled by Kerr-McGee's Rig 46 has been converted into a triple completion in two oil zones and one gas zone. It is now capped.

A small permanent platform will be built for the well, and the same will be done for two other relief wells.

Rig 46 drilled its well into the producing sands of the E-5 well, a triple producer.

The Vinegarroon and Mr. Gus II drilled their wells into the producing zones of E-7, which was being readied as a quadruple completion when the explosion occurred. Continental is undecided yet how to complete these two wells.

On the platform . . . Decisions also must be made on what to do with the original E-5 and E-7 wells.

Continental hopes to find other producing zones along the route of the directional holes that will not conflict with other production.

Of the seven platform wells, the E-3 is the first to be tackled. It was a triple completion, and Continental is now studying the condition of its subsurface equipment.

Three of the seven wells were dual completions, three were triples, and one a quadruple. Continental plans an extensive reworking program that will put all the wells back on production. Service Contracting, Inc., Harvey, La., is the contractor on the job for CATC.

The history-making explosion occurred October 15, and the last wild well was not capped until late November (OGJ, Nov. 24, 1958, p. 43).

New quadruple . . . Meanwhile, CATC has another four-zone completion in the same area, but on another platform.

The 45 C-10 well, in Block 30, has been completed in four pays between 6,824 and 9,653 ft. Total depth is 9,940 ft. Flows of 214 to 359 bbl. per day have been reported on chokes of ⅛ to 10/64 in.

INDUSTRY BRIEFS . . .

The U. S. Supreme Court has closed the door on the "Memphis decision." It refused last week to reconsider its December 8 ruling that interstate pipeline companies can raise gas rates without advance customer approval. A rehearing was sought by City of Memphis and Mississippi Valley Gas Co.

New York joined the 6-cent state gasoline tax group last week. A Republican dominated legislature which denied former Gov. Averell Harriman the same increase 2 years ago readily approved a two-cent jump for Gov. Nelson Rockefeller.

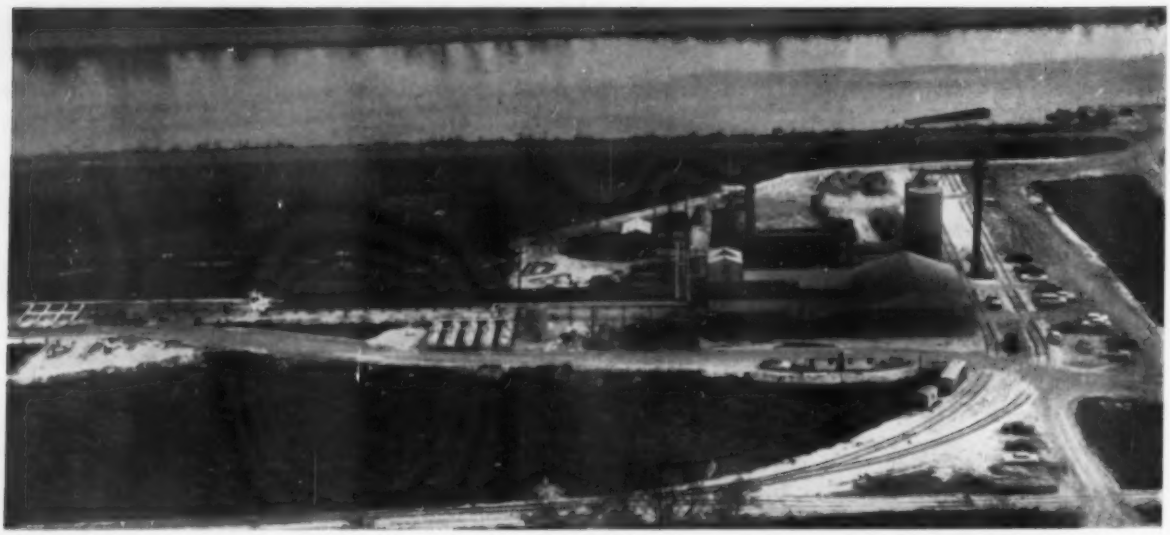
Standard of California will step up drilling in the Swanson River unit on Alaska's Kenai peninsula when a second rig is sent there this spring. Bid requests are out specifying a rig capable of drilling to 18,000 ft.

Pan American Petroleum's apparent gas discovery in extreme northern British Columbia has touched off a lease play in nearby Northwest Territories. The 1 Beaver River, which blew out, caught fire, and killed two members of the drilling crew earlier this month, was brought under control in less than a week. Blowout occurred at 8,520 ft. below middle Devonian (OGJ, Jan. 19, p. 69).

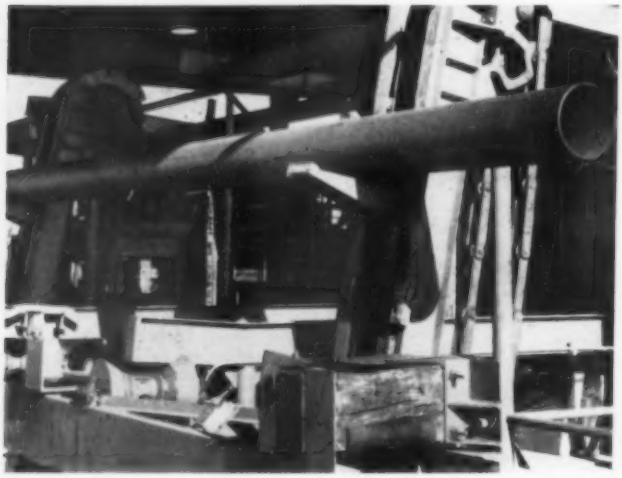
Richfield Oil officials will meet with the Canadian officials in Ottawa this week to discuss the possibility of a nuclear explosion in Richfield's 2-million-acre Athabasca tar sand lease in Northeast Alberta.

A new depth record for Los Angeles Basin has been set by California Standard at the 1 Carlin Community 4 miles east of Rosecrans field. The test in Section 14-3s-13w, was drilling below 15,195 ft. in more than 14,000 ft. of open hole. Projected depth is 15,500 ft. Previous depth record was 14,950 ft., set by Shell in Long Beach field in 1946.

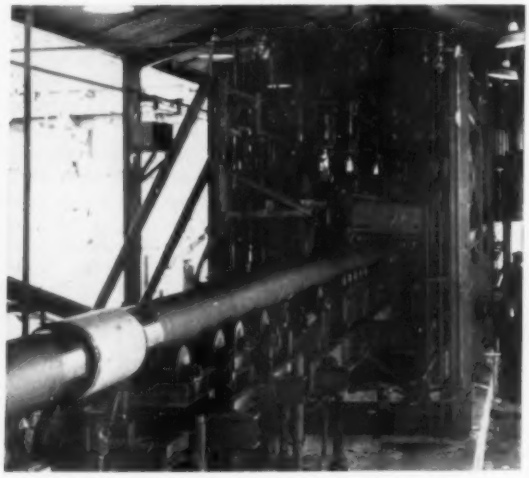
A stock split of 2½ shares for 1 is planned by Union Oil & Gas Corp. of Louisiana. Stockholders will be asked to approve the move February 4. The plan calls for an increase in authorized stock from 2,000,000 to 6,000,000 shares. Bid price on Union stock was $97 last week.



1 WORLD'S LARGEST pipe-coating plant is the claim of Timcoat Corp. for its installation at the Brown & Root, Inc., yard at Belle Chasse, La., on the Algiers Canal.



4 TRANSFER MACHINE picks up cleaned pipe and moves it on to coating conveyor.



5 COLLAR (lower left in photo) prevents coating of ends so that field joint can be made.

Big Coating Plant Is Open for Business

COMPLETION of Timcoat Corp.'s plant near New Orleans will permit large-scale pipe coating with a new rubberized-asphalt-mastic material.

This combination weight and corrosion coating, rather than hot enamel and concrete, is applied on all marine lines laid by Southern Natural Gas Co. Southern Natural and Brown & Root, Inc., own Timcoat.

Up to now the company has been limited by a single plant mounted on a barge (OGJ, Sept. 15, 1958, p. 129). The plant will enable Timcoat to bid for business from other pipelines active offshore and along the Gulf Coast.

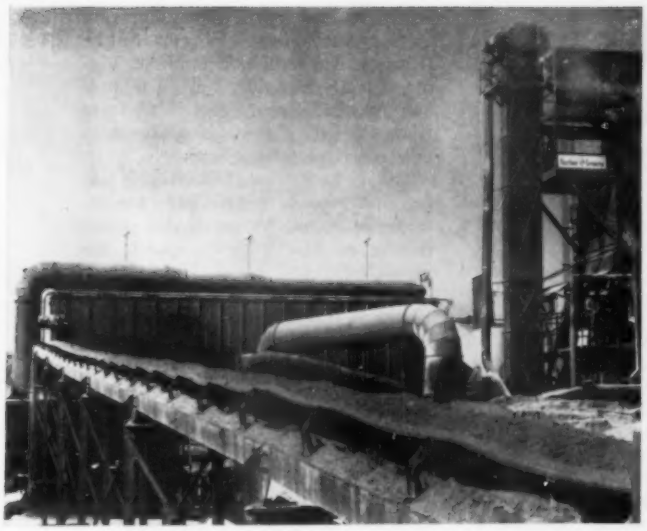
An automatic conveyor system moves the pipe and coating materials rapidly along the assembly line.

The first step is mixing sand, barite, barite fines, limestone fines, and liquid asphalt, which are superheated in a surge hopper by hot circulating oil. Liquid rubber and strands of glass are added just before the mix moves into the extrusion hopper.

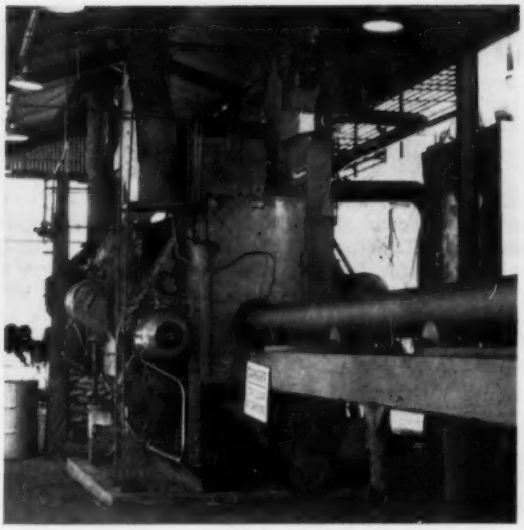
The pipe is first dried and cleaned, then moved through the coating extruder by a drive exerting a thrust of 25,000 lb. After being wrapped, cooled, and whitewashed, the coated pipe is stacked in the yard, which can store up to 1,000 miles of line pipe. It is ready for shipping since no curing is required.

Timcoat claims the coating is impervious to water and marine borers.

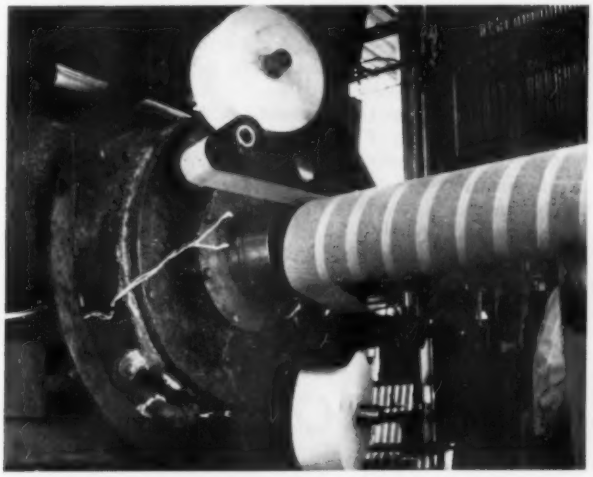
In laying off the end of a barge, the coated pipe can be flexed as much as the steel will stand without cracking or flaking the coating, the company reports. Experience since 1956 proves the coating to be effective against corrosion and competitive in cost with other materials, Timcoat says.



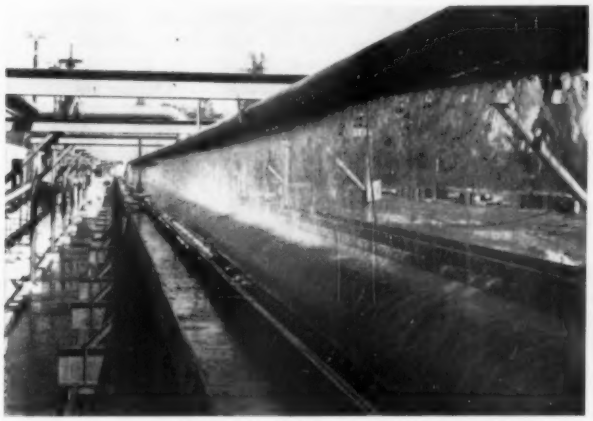
2 CONVEYOR transports dry material of rubber-asphalt-mastic coating to mixing machine.



3 AFTER FLAME DRYING, pipe passes through grit-shot blast machine for cleaning.



6 CLOTH WRAPPING prevents sagging after the pipe has been coated.



7 WATER SHOWER cools coating, applied at 360° F., to hasten hardening.

8 COATING is ⅞-in. to 2½-in. thick., depending on negative buoyancy required.

Subsidence Area Rises

. . . slightly at several points after repressuring of small area of Wilmington field. Sinkage continuing elsewhere.

A SLIGHT surface rise—instead of the usual drop—has been shown in one part of California's sinking Wilmington field.

Not only was subsidence halted in a square-mile area following pilot-flooding operations, but the land surface actually rose 0.6 in. at several points.

Long Beach city officials said results of the flooding in the Tar, Ranger, and Terminal zones of fault blocks, II, III, V, and VI show that repressuring will check subsidence.

The subsidence study was made by the Long Beach Harbor Department of a square-mile area operated by the Long Beach Oil Development Co. and Richfield Oil Corp.

The harbor department said sinkage continued in other parts of the field, however.

Court action . . . Meanwhile, in U. S. District Court in Los Angeles, Judge Harry C. Westover handed down several rulings: He:

. . . Denied a motion for dismissal of the Justice Department's suit against Wilmington producers.

The Government is seeking compulsory repressuring or shutting in of the field and multimillion-dollar damages for subsidence damage to government installation.

. . . Ordered removal of the names of 274 former Wilmington field producers who were listed as defendants.

. . . Set March 24 as a hearing date for testimony on the probable cause of subsidence in Wilmington field.

. . . Gave the Government and 121 present producers named as defendants until February 24 to file briefs on the question of whether subsidence is a nuisance and whether an injunction should be granted, shutting in the field.

. . . Raised the question of whether the Government's cause could best be served by a financial judgment against the producers, rather than an injunction.

Another front . . . Subsidence also is being attacked by the Long Beach Board of Harbor Commissioners.

The commissioners have shut in 78 high gas-oil ratio and water-cut wells located on city tidelands. The wells are operated for the city by LBOD and Richfield.

Counter offensive . . . Spurred by the threat of a possible court-ordered shutdown, operators in the field were rushing water-flood plans.

A king-size flood is planned, aimed at injecting 1,717,000,000 bbl. of seawater over a 5-year period. Estimated cost is more than $59,000,000, including $25,500,000 for injection equipment and $34,300,000 for water handling and treatment.

Designed primarily to halt subsidence, the huge water-flood campaign also will increase ultimate recoveries from the 7,500-acre field. Estimates of additional recoveries from the repressuring program range as high as 665,000,000 bbl.

Navy Reserves Hit

by Eisenhower. Navy asked to drop outdated holdings.

PRESIDENT EISENHOWER, the old Army strategist, caught the Navy off guard last week with his suggestion that it get out of the oil business.

The proposal, though greeted by official silence from the Navy, seemed headed for a fight on Capitol Hill. There, Navy boosters enjoy a little more freedom to talk back to the commander-in-chief.

Eisenhower didn't exactly recommend that the Navy abandon its long-nurtured desire to compete with the oil industry. He merely wondered out loud if it wouldn't be wise to dispose of what he termed the Navy's "anachronistic" petroleum reserves.

In his budget message, Eisenhower pointed out that the "continued and rapid growth in the use of petroleum products has made questionable the need for maintenance of the relatively small naval petroleum reserves . . ."

He said disposing of the reserves would relieve the Navy of an "inappropriate responsibility" and would also provide additional revenue to the Government.

New reserve sought . . . The suggestion came just as naval officialdom was trying to stake out a fifth petroleum reserve to add to the four already held.

In another effort to expand its oil holdings, the Navy has been seeking control of the Government's oil-shale plant near Rifle, Colo.

Rep. Carl Vinson (D., Ga.) is expected to rise to the Navy's defense in Congress. He is chairman of the House armed services committee. Vinson recently introduced a bill to turn San Nicolas, San Miguel, and Price Islands off the California coast into a new naval petroleum reserve.

Sen. E. L. Bartlett (D-Alaska) is taking the opposite course. He has introduced a bill to return the naval reserve in Alaska to the public domain.

If the reserves are maintained, Eisenhower estimates they will cost the Government $2,125,000 in appropriations for next fiscal year.

FTC Cracks Down

on Sun for helping dealer with gasoline price cut.

THE Federal Trade Commission has clamped down on Sun Oil Co. for lowering the price of gasoline to a single dealer to help him survive a price war.

Adopting a decision by one of its examiners, the FTC held that Sun violated the Clayton Act in giving special price assistance to a Jacksonville, Fla., dealer in 1955. The commission also held Sun violated the Federal Trade Commission Act by conspiring with the dealer to fix the retail price of gasoline.

Sun said it would immediately appeal the decision to a Circuit Court. The company denied the price-fixing

PROCESSING

Ethyl Corp.'s latest annual report on new auto models shows smallest gains this year for compression ratio, horsepower, and displacement since 1947. Average compression ratio went up slightly to 9.5 : 1, average horsepower up one point to 260, and average displacement up 13 cu. in. to 338.

Du Pont has developed a new corrosion inhibitor for avgas. The AFA-1 aviation fuel additive has high effectiveness at low dosages. As little as 4 lb. per 1,000 bbl. works to prevent corrosion. The additive contains about 5.3% phosphorous by weight and has an extremely low ash content.

Marketing territory of fast-growing American Petrofina has expanded to the St. Louis area. The company will distribute products through the 78 stations of Midwest Petroleum Co., formerly one of Tidewater's largest dis-

charge. It contended it was meeting competition "in good faith" as permitted by law.

The FTC ordered Sun to stop charging any of its service-station customers less for products than it charges competing dealers in the same marketing area. The company also was barred from "conspiring illegally" to fix the resale price for its products.

Sun's story . . . The special discount of 1.7 cents a gallon was granted after an independent station opened across the street from the Sun dealer. The independent cut gasoline prices as much as 7 cents a gallon below the price posted by the Sun dealer.

Other Sun dealers in the area did not share in the discount and lost business as a result, the FTC held.

"If the narrow interpretation of law used here is allowed to stand we doubt the ability of any supplying company to come to the aid of a dealer under any circumstance," warned Willard W. Wright, Sun vice president.

Platform Sinks Off Louisiana

HEAVY SEAS have sunk a mobile drilling platform that was in trouble off Louisiana.

C. E. Thornton, executive vice president of Reading & Bates Offshore Drilling Co., said the rough water snapped the 12 legs of the platform, causing it to settle to the ocean floor. He said it is lying upright.

Don't Miss Yours!

SOME TIME this week, after you have received this copy of your Oil and Gas Journal, you will receive an extra issue of the Journal.

It's Petroleum Panorama. In it, Journal editors give you a fast-reading account of 100 years of oil, covering the excitement, technical developments, and significance of events in the industry's history.

This is a Journal issue you'll want to read and keep. Don't miss it!

The platform, owned by Trans-Gulf Offshore Drilling Co., listed 30 degrees the week earlier while it was preparing to move to another location (OGJ, Jan. 19, p. 62). Thornton said the ocean floor was not solid enough to withstand the movement caused when the platform was being lowered to the water level. He said there was no apparent mechanical failure.

Reading & Bates plans to refloat the platform when weather permits.

New Alaska Wildcat Planned

GENERAL PETROLEUM Corp. will drill a wildcat on lands held by Great Basins Petroleum Co. and others in the Bristol Bay area of the Alaska Peninsula.

Exact starting date and drill site are still to be determined by the company.

General Petroleum and Great Basins made a joint geological and geophysical survey of the holdings last summer. The nearest active drilling project is Humble Oil & Refining Co.'s wildcat at Bear Creek in the Widebay-Kanatak area 35 miles east, which was drilling ahead below 13,535 ft.

Sediments in the Bristol Bay area correlate with those found productive on the Swanson River Unit on Kenai Peninsula 200 miles northeast.

Texas Fire Flood Planned

JOHN H. DeFORD, Abilene, Tex., has asked the Texas Railroad Commission to approve a unit agreement and a pilot thermal-recovery project in Coleman County Regular field, West Central Texas.

The fire flood would be in the Amerada sand under DeFord's Knight B, C, and D leases. The pilot project initially would affect about 3.7 acres. DeFord plans to inject air at a rate of about 300,000 cu. ft. a day into the sand topped at about 150 ft. Injection would be into the center well of a five-spot pattern. DeFord would inject air for about 14 days before trying to ignite.

The three leases have produced about 3,800 bbl. of oil, but production has declined to about 1 bbl. daily per well. Operator estimates added recovery from the thermal project at about 15,000 bbl. Total oil in place originally was estimated at 35,000 bbl.

BRIEFS . . .

tributors. American Petrofina, which began operations about 2 years ago, now has 1,600 outlets, mostly in the Mid-Continent and Southwest.

Aurora Gasoline Co. has let contract to Refinery Engineering Co. for a 3,680-bbl. sulfuric acid alkylation unit at Aurora's Detroit, Mich., refinery. TRECO expects to start field construction within 3 months. Completion is scheduled for third quarter of 1959. Included in the work will be a deethanizer for processing alkylate feed material from the crude and Rexformer units and distillation drying facilities for propane.

TRECO also is completing work at the Aurora plant on a 18,000-bbl. daily vacuum unit.

Pincher Creek gas-processing plant in Alberta is being expanded by British American. Ralph M. Parsons Co. of Canada, which had contract for the first two stages of construction, is also handling the third stage. Present capacity of the plant is 120,000 M.c.f. daily. Plans call for ultimately doubling this capacity (OGJ, Oct. 20, 1958, p. 55), which will rank Pincher Creek among the world's largest field processing plants.

Gulf has increased ownership from 25 to 50% in Callery Chemical Co., Pittsburgh, a firm specializing in production of high-energy fuels. Purchase was made from Mine Safety Appliances Co., which holds the other 50%.

An automatic natural-gasoline plant, with capacity of 40,000 M.c.f. daily, is being built by Sunray 16 miles northeast of Port Lavaca in Jackson County, Texas. It will be one of the first of its type to operate unattended at night. The plant is the refrigeration oil-absorption type and will turn out 27,000 gal. of products daily when completed in mid-March.

Production of lubricating greases and fluid gear lubricants in 1958 is being surveyed by the National Lubricating Grease Institute. First such survey was taken last year, showing that the industry had produced more than a billion pounds of lubricants in 1957. Canada will be included in the new survey.

Also for Refiners . . .

IN THE NEWS: The 5% wage increase is spreading to most segments of the industry. Cost will be $127.9 million a year (p. 97) . . . Price cuts by crude buyers since November have shaved $94,718 daily from cost of crude to refiners (p. 102) . . . New filter now in airfield use dewaters jet fuel (p. 107) . . . Annual review and forecast (pp. 119-189).

Western Europe May Burn Sahara Gas

- Two ideas are being pushed by former French minister. One is an Africa-to-Europe pipeline that runs under the Mediterranean. The other calls for moving the gas by tanker as liquid methane.
- Study commission says gas can be laid down in Europe at 51 cents per M.c.f. by tanker and even less by pipeline. But some big "ifs" cloud the future of both proposals.

THE COUNTRIES of western Europe are being urged to join in a multimillion dollar, hydra-headed project to move the Sahara's natural gas to European consuming centers by pipeline and methane tankers.

The machinery involved in getting the project approved is just about as ponderous and slow as the proverbial mills of the gods. If the plan ever gets moving, it could be a serious competitive rival to the dreams of Constock Liquefied Methane Corp. to move Western Hemisphere gas to Europe in liquid form (OGJ, Jan. 5, page 76).

Tanker hauls from Algeria would be less than half the distance to gas-hungry European markets. Pipeline proposals involve underwater crossings with problems never yet tackled by the pipeline industry.

The Sahara gas-to-Europe scheme is the brainchild of Maurice LeMaire, former French minister of commerce. He heads a study group of the Economic Committee of the Council of Europe's consultative assembly. LeMaire's committee has recommended the project in glowing and urgent terms to the 135-member consultative assembly, the council's debating society. If it approves, the committee of ministers will then consider the project and if they buy it, in turn will ask their own governments to take part.

LeMaire's committee is urging the members of the Council of Europe to create "Eurafrigas" as a "major instrument" for the future development of both Europe and Africa.

The need . . . The LeMaire report refers to numerous energy studies of the past few years which chart western Europe's future fuel needs.

It cites predictions that this part of the world will fall short of its fuel needs by as much as the equivalent of 250 million tons of coal by the year 1965. The committee believes that today one gas field in the Sahara, Hassi R'Mel, can supply the equivalent of 75 million tons of coal a year, with all indications that the supply is much greater.

"A speedy solution to this problem is vital to the future of Europe, Africa, and the free world. Every year, or even month, gained may be equivalent to a decisive victory," the report says.

"We need to pool all necessary financial, technical, and moral resources to carry out this incomparable undertaking."

The report concedes that France alone can develop the gas production, as she is doing, but points out that distribution of the gas involves "extremely important questions of financing, as well as technical, economic, and political problems."

The supply . . . The committee talks generally of natural-gas supplies available in the Sahara, where the French have found as much gas as oil or more.

The prime source cited is Hassi R'Mel, the mammoth gas reserve already established with only seven wells. The field already proved is at least 30 miles long from southwest to northeast and at least 18 miles wide.

The committee says Hassi R'Mel alone can produce 1,500 M.M.c.f. of gas daily.

Just last week French sources estimated the field's proved reserves at 17 trillion cubic feet with probable reserves of 28 trillion.

Six months ago it was estimated that Hassi Messaoud, the big oil field 190 miles southeast of Hassi R'Mel, could add another 200,000 M.c.f. of gas daily to the available Sahara supply.

North Africa needs . . . The primary gas consumer in North Africa is Electricite et Gaz d'Algerie, which serves Algiers and a few other populous regions of the country. The only other two large industrial consumers of energy in the area are large cement plants at Algiers and Oran.

If all three converted from imported coal and fuel oil to natural gas, the committee estimated their total consumption of gas would not top 40,000 M.c.f. daily before 1961.

The committee estimated further that if all the currently talked plans for fertilizer plants in Algeria and the steel works planned for the Bone area bear fruit, Algeria still will not consume more than 98,000 M.c.f. daily by 1965. This leaves Europe as the obvious market.

The problems . . . The committee has resolved the issue into two major problems—distance and the Mediterranean.

Distance itself is no problem, the committee says, pointing to long natural-gas transmission lines in the United States and Canada. The Mediterranean is something else. There are three possible solutions:

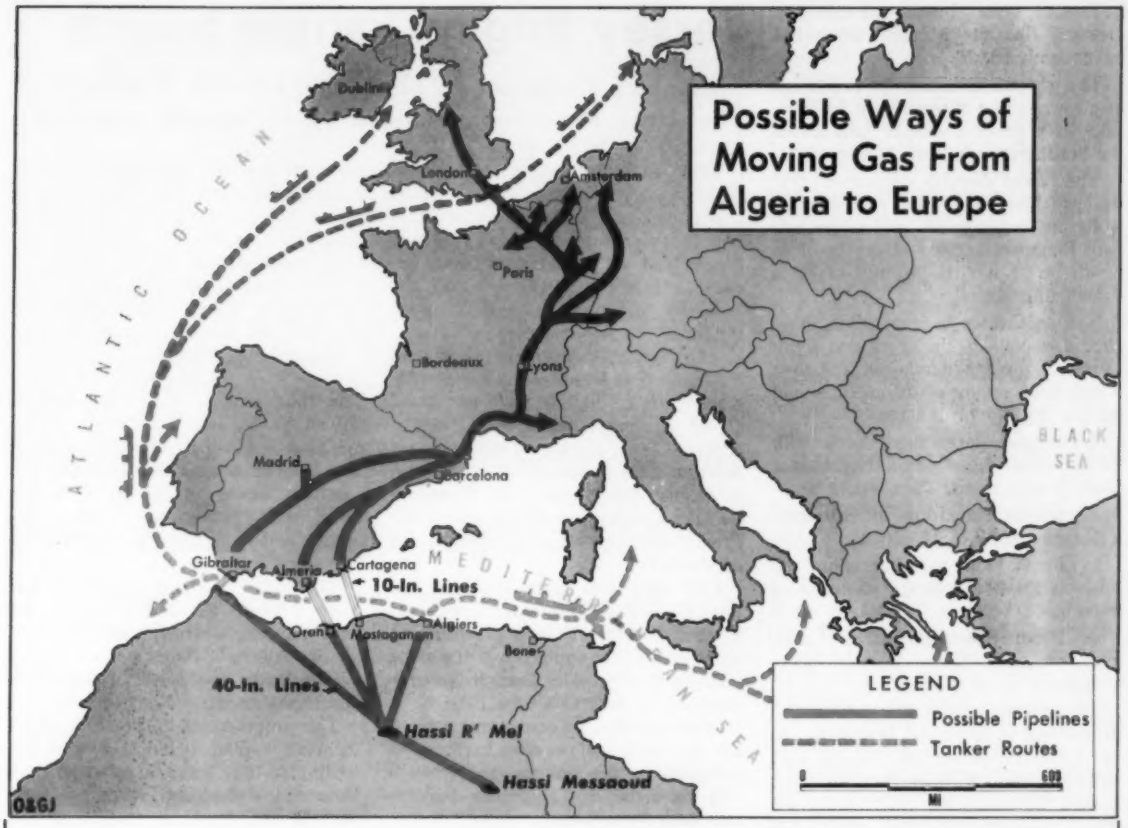
. . . Liquefied-methane tankers similar to the "Methane Pioneer" which soon will make the first trip of its kind from the U. S. Gulf Coast to Great Britain loaded with 33,000 bbl. of liquefied methane.

. . . Forty-inch pipelines from the desert gas fields to, and smaller ones across, the Mediterranean to several points in Spain.

. . . Electric power produced in Algeria using the natural gas as a fuel and then moved at high voltages across the Mediterranean by submarine cables.

The third method was discarded almost as soon as it was proposed. The committee said such a consumption of gas would hardly touch the possibilities of the supply involved.

Methane tankers . . . To move the Sahara gas to Europe by tanker, the experts who made the study said new vessels of from 20,000 to 50,000 tons



Price of Sahara Gas Delivered in Europe

By Pipeline

Consuming area—	Price* (per M.c.f.)
Algiers	14 cents
Spain (Catalonia)	27 cents
Provence	30 cents
Lyons	31 cents
Switzerland	35 cents
Lorraine	37 cents
Ruhr	41 cents
Lille-Brussels	42 cents
London	44 cents

By Tanker as Liquid Methane

Destination—	Distance (miles)	Annual Supply† (M.c.f.)	Price* (cents per M.c.f.)
Marseilles, Naples, and Barcelona	480 to 600	53,000,000	46
Greece, Turkey, and LeHavre	1,800	35,300,000	55
London, Antwerp, and Dublin	2,100	53,000,000	60
Hamburg, Copenhagen, and Gotenburg	2,400	35,300,000	64

*Assuming a price of 10.2 cents at the source. †Fleet required: 5 tankers of 3,500 tons and 8 tankers of 15,000 bbl.

could be built or smaller oil tankers in the 12,000 to 17,000-ton class could be converted to methane ships.

This whole project undoubtedly would hinge on the success or failure of the Methane Pioneer project. The committee pointed out that Gaz de France has followed all developments in this field closely. The French gas distributor, which gets its supply from the huge Lacq field in southwestern France, has already set up a storage depot for liquefied gas at an Atlantic port (presumably Bordeaux).

The committee estimates that 176,500,000 M.c.f. of gas a year could be moved from Hassi R'Mel to European markets by tanker. This is about 485,000 M.c.f. daily.

Figuring the cost of a pipeline from the field to the coast and tanker transportation at an average distance of 1,200 miles, the committee says the gas could be delivered at most points for about 51 cents per 1,000 cu. ft.

This cost figure assumes a field price of 10.2 cents and another 41 cents for liquefaction, storage, and regasification.

All this, the report says, would involve an investment of about $389 million. Here's how the initial investment for liquefaction breaks down when figured on moving the gas a mean distance of 1,650 miles:

	(Millions of dollars)
Pipeline, Hassi R'Mel to Algerian coast	$96
Liquefaction	96
Methane tankers	120
Storage, regasification	77
Total	$389

Pipelines . . . The report concedes the pipelines pose the greatest technical problems. Pipelines have crossed

bodies of water in the past, but a crossing like the Mediterranean has never been tried.

The gas can be laid down in Europe at a lower price by moving it by pipeline—if a gas line can be laid across the Mediterranean from Africa.

The report discards suggestions that the gas lines might be run through a tunnel constructed under the sea bed. Pressures exerted at depths of as much as 1,300 ft. would make a tunnel impractical.

The committee believes 40-in. lines should be built to the north and south shores of the Mediterranean and then a manifold system of 10-in. lines laid on the bottom of the sea.

Three such large lines, each with its own battery of small underwater lines, is envisioned. They would be:

... **Across the Straits of Gibraltar,** a distance of 12 to 18 miles.

... **From Oran to Almeria** on the Spanish southern coast, a distance of 96 miles.

... **From Mostaganem to Cartagena,** on the southeast coast of Spain, a distance of 114 miles.

The distance from Hassi R'Mel to Strasbourg in industrial France would be 1,920 miles via the Straits with the line passing through Barcelona and Lyons. It would be 1,620 miles via the Oran-Almeria route and 1,440 miles by the Mostaganem-Cartagena route.

The committee says "experienced technicians" say there are no "insurmountable difficulties involved.

It recommends an immediate hydrographic survey of the Mediterranean sea bed as a starting point.

The costs? . . . The committee said it was leaving a margin for error when it placed a price tag of $96 million for a sea-crossing project necessary to link Mostaganem and Cartagena, the longest of the three routes.

At the same time, the report said that an investment of from $600 million to $720 million will be necessary for each system capable of moving 10 billion cubic meters of gas a year. This is just under 1,000,000 M.c.f. daily.

With this kind of an investment, the report says natural gas can be moved to Strasbourg at a cost of 37 cents per 1,000 cu. ft., assuming a price of 10.2 cents per 1,000 at the field.

This cost figure, on paper, undercuts the tanker costs a great deal. The committee reasons that the emphasis should definitely shift to pipeline movement as soon as more gas supplies in the Sahara are proved and made available.

Jersey Begins Sahara Search

. . . with French on 7,722-sq.-mile block in Algeria, west of Hassi Messaoud. Planned 24-in. line will cross tract.

THE LONG-AWAITED, long-rumored, and often cautiously denied announcement that the world's biggest oil company is taking part in the hottest oil exploration race became a fact last week.

Jersey Standard is going to hunt for oil in the Algerian Sahara.

The French Government announced last week that Jersey will have a 50% interest in a 20,000 sq. km. block (7,722 sq. miles) along the Tunisia-Algeria-Libya border. The block of acreage first appeared in oil circles in August, 1956, when Cie. Francaise Petroles (Algerie), a subsidiary of the French oil giant applied for the area officially.

CFP (A) will own 35% of the joint U. S.-French venture. Petropar, a wholly owned French Government oil investment company will have the remaining 15%. The French Government owns only 35% of CFP.

Hard pressed for competent personnel to carry out a new exploration program in the Sahara, the French will leave the first stages of exploration entirely to Jersey.

Most qualified French oil engineers are hard at work helping government-controlled French companies develop Hassi Messaoud, Edjele, and other productive oil or gas areas the French have found so far in the Sahara.

Paris sources last week said a managing board is expected to direct the work on the new big concession with a French chairman.

The concession . . . The acreage involved in the new concession agreement stretches for 180 miles along the Tunisia-Algeria border and the southern border of the block is just south of the point where Tunisia, Algeria, and Libya have a common boundary.

The block is about 110 miles due west of Hassi Messaoud, the biggest field the French have discovered so far in Algeria's Sahara. It is about 170 miles to the north of the fields developed in the Edjele area.

The proposed 24-in. pipeline which the French plan to build from Edjele north to the Tunisian port of La Skhirra, just north of Gabes, will pass through the southern portion of the Jersey-French concession.

Persian Gulf Alive With Rigs

. . . with two mobile barge units already operating, three more due from U. S. Deep test offshore Iran is planned.

THE PERSIAN Gulf will literally be sprouting drilling rigs, all operating from mobile drilling barges, by late spring or summer.

Two such units are already drilling in the Gulf, two more are on the way from the U. S., and a fifth is now being equipped for the long haul from Orange, Tex.

The latest is a Delong-type standard offshore unit equipped with an Emsco 2500-E rig capable of drilling the first 16,000-ft. test offshore Iran planned by Pan-American International Co. Portions of the barge's steel deck are now being planked to take some of the blister out of the Gulf's 130° temperature. It will leave Orange "soon."

Rigs on way . . . The barge will be operated by Seacat Marine Drilling Co., S.A. (Persian Gulf). The drilling company is owned by Southeastern Drilling, Dallas; Turnbull & Zoch Drilling, Corpus Christi; Frank G. McClintock, Tulsa, and Contracting & Trading Co., Beirut, Lebanon.

Pan Am's first test of its offshore Iranian acreage, in which the Iranian Government Oil Co. has a 50% interest, will be spudded some time this summer.

Arabian American Oil Co. has a three-legged LeTourneau barge at work in its newly discovered Manifa field. A similar unit built for the Italian company, Saipem, left the U. S. early in December headed for the Persian Gulf acreage which the Italians share with the Iranian Government company.

The joint French British company, Abu Dhabi Marine Areas, Ltd., has a Delong-type barge operating in the southern Persian Gulf on a stepout to the apparent major discovery.

The C. E. Thornton drilling barge, owned by Reading & Bates, Tulsa, left Orange late in December headed for the Neutral Zone offshore concessions obtained by the Japanese.

Paris Basin Strike Sets Pace

. . . for drilling surge in northwestern France. BRP sees 1959 gains with Coulommes and five other areas active.

EXPLORATION in northwestern France is off to a good start with a new Paris basin discovery.

Regie Autonome des Petroles (RAP) has brought in a 75-bbl. daily well on a concession southeast of Paris in the Aube district. Pay in the Grandville 101 was found at 6,780 ft.

The find with others in the basin has led a spokesman for the French Government's BRP to say: "Undoubtedly, the Paris basin discoveries were the most important event in the French oil industry in 1958. The year can be called the year of the Paris basin, and 1959 will be even more so."

Two companies already have their last year's discoveries on production. PETROREP has drilled 13 wells on the Coulommes structures, about 20 miles east of Paris. Eleven were producers, one was dry and another was a water well. Coulommes is expected to produce 2,000 bbl. daily this year and 3,000 bbl. daily in 1960.

Wildcats drilling . . . Second commercial find in the area was made by FROPEX, owned 45% by American Overseas Petroleum, a Caltex company, and 55% by CEP. The Chateaurenard field is 60 miles southeast of Paris. Three out of four wells drilled are commercial, making from 38 to 94 bbl. daily from the Neo-Commian series between 1,750-1,970 ft.

Extensive wildcatting is under way in other parts of the basin. PETROREP has had good shows at 8,940 ft. at Crouy-sur-Qurcq, 15 miles north of Coulommes.

CEP is drilling a stepout to its discovery at Chaillis-en-Biere, about 40 miles southwest of Paris. RAP is drilling ahead at 7,260 ft. on a wildcat at Nangis. The Paris basin discoveries are the most important since Parentis was found 5 years ago in the Aquitaine basin of southwestern France.

Big Borneo Project

calls for 30 new wells by Shell, 161-mile pipeline.

THE LAST undeveloped oil field held by Royal Dutch-Shell in Indonesian Borneo will be tapped in a $50-million development program.

Shell will build a 161-mile, 20-in. pipeline from Tandzung field to its Balikpapan refinery in the next 3 years. The system is being designed to move 40,000 bbl. daily when it opens by January 1, 1962. Plans are to raise throughput capacity to 65,000 bbl. daily later.

Company pipeliners are facing the special problem of moving 38.9°-gravity crude that is waxy and has a high pour point. This is the same type of hurdle encountered by Stanvac when it built an outlet for Lirik field in Sumatra.

Stanvac ships its Lirik crude through a heated pipeline. But Shell, in order to avoid intermediate heating stations in a longer line, will pump the crude in suspension, mixed with 30% water. Williams Brothers Overseas, Ltd., of Tulsa and John Brown, Ltd., of London will start work on the system in March.

Thirty more field wells will be drilled in the program. Shell has invested $15 million in Tandjung since its discovery in 1938. Thirty-two wells have been completed so far in horizons that produce from 2,500 and 4,300 ft.

Leonard Astley-Bell, the Royal Dutch representative in Indonesia, said Shell is going ahead with the project on a gamble that the government will correct the problems besetting oil companies in Indonesia.

Campeche Tests Hit

to give Mexico its first offshore crude production.

DISCOVERY of Mexico's first offshore oil field is claimed by Pauley Pan American Petroleum, Inc., with a pair of wells in the Bay of Campeche ½-mile offshore from Coatzacoalcos, Veracruz.

The discovery well, 112 Rabon Grande, tested at a 442-bbl. daily rate from an undisclosed interval. The followup well, 111 Rabon Grande, was dually completed in intervals at 2,316-19 ft., and 2,848-62 ft.

Both zones tested for 500 bbl. daily of 30°-gravity crude. The well was placed on production January 6.

The Pauley discovery was made under one of three exploration and development contracts it has with Petroleos Mexicanos. Drilling was done by Ocean Drilling & Exploration Co. of New Orleans.

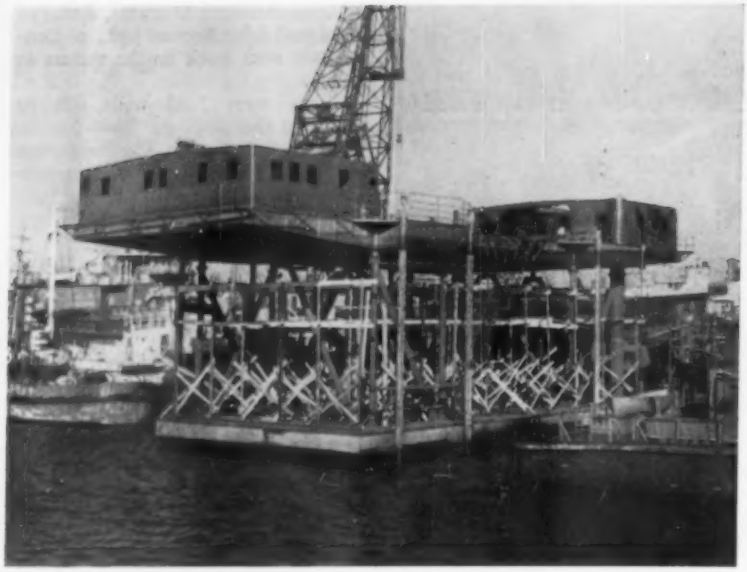
After four dry holes, ODECO and Pauley late last year completed an offshore gas well, testing 1 million cubic feet per day in the Bay of Campeche off Coatzacoalcos (OGJ, Nov. 24, p. 63).

Phillips Hits Big Lake Well

A SECOND BIG well has been brought in on block 17 in Lake Maracaibo.

Phillips Petroleum Co. completed the LPG 14-4 at total depth of 13,015 ft. with a flow rate of 7,008 bbl. daily "from a very thick section of Eocene pay." It is 3,900 ft. north of the LPG 13-2 discovery well, completed last December for 6,600 bbl. daily.

Phillips' partners are Sunray Mid-Continent, Ashland Oil & Refining, Western Natural Gas, El Paso Natural, Kerr-McGee, and Venezuelan Pacific Petroleum.



Russia Readies Barge for Caspian Sea

IF THIS OFFSHORE drilling barge looks just a bit different from outfits seen along the U. S. Gulf, there is no cause for surprise. The unit is a new one launched in the Azerbaijan region of the Soviet Union.

The 450-ton outfit was built as part of Russia's drilling program in the land-locked Caspian Sea, off Baku. The unit will operate in 20 ft. of water. It will be self-contained, with a 5,400-sq. ft. deck holding the rig and derrick, fuel, an electric logging laboratory, and living quarters.

Drilling has gradually moved seaward for years at Baku, once the center of the Russian oil industry. Output is down from its heyday period, but production is well over 300,000 bbl. daily and has risen slightly in recent years. Until now, rigs drilling on the Caspian have been set up on long piers connected directly with shore.

Pan Am Tests Start

on a million-acre Argentine block. Ten rigs to be used.

THREE WELLS have started drilling in southern Argentina and seven other rigs will be placed in operation there soon by Pan American International Oil Co.

The wells are initial tests on a rectangular block of about one million acres 30 miles west of the east-coast port of Comodoro Rivadavia. Equipment now on the ground will be used to drill the first 50 wells provided under Pan American International's agreement with Yacimientos Petroliferos Fiscales, the Argentine state oil organization.

Pan American was the first foreign oil company to complete an agreement covering oil development operations with the Argentine government under the Frondizi regime.

The agreements entered into by the government are a part of the Frondizi administration's program to make Argentina self-sufficient in oil production possibly within 3 years.

Petroleum imports at the present time represent 21% of all Argentine imports, as the country brings in 65% of its oil needs. The country now produces about 94,300 bbl. of crude oil daily while its demand is more than 2½ times greater (OGJ, Dec. 29, p. 89, and OGJ, Jan. 19, p. 73).

WORLD BRIEFS . . .

A concession covering all of Ireland has been granted to Ambassador Oil Corp. of Fort Worth. The company will spend at least $500,000 on exploration the first 5 years, and start a wildcat within 2 years (OGJ, Oct. 6, p. 124).

The Guatemalan subsidiary of Royal Dutch-Shell will spud its first wildcat in April. Location is 30 miles east of Flores in northern Guatemala's Peten department. Kerr-McGee of Oklahoma City will be the drilling contractor, using a 7,000-ft. rig.

Superior Oil will build a new terminal on the east side of Lake Maracaibo, replacing Talon Petroleum's La Estacada terminal, which Superior has purchased. A tank farm with 370,000-bbl. storage capacity will be built on a 50-acre plot 3 miles inland and located on Shell de Venezuela's pipeline right-of-way to Puerto Miranda. Talon's 1,500-bbl. daily crude production, piped from properties 30 miles to the east, will be handled by Superior.

A farmout agreement in Negev Desert of Israel between Denver-Golden Oil & Uranium Co. and Pan-Israel Oil and Israel - Mediterranean Petroleum provides Denver-Golden will earn a 10% working interest in an 80,000-acre concession by drilling a shallow wildcat on the Kurnub structure. Denver-Golden has an option to drill four more wells and earn up to 50% interest. First test was due to start this month.

An order for four big tankers from a Netherlands shipyard has been changed to three vessels which will be even larger. Instead of four 47,000-ton ships from Verolme shipyards in Rotterdam, Esso Nederland will get three 73,000 tonners. Esso Petroleum also may increase the size of two 47,000-ton ships on order in England to more than 70,000 tons.

The 1 Puri discovery in Australian New Guinea has been plugged back above the producing zone, and a deviated hole will be drilled back into the oil formation. BP, Stanvac, and a local firm, Oil Search, have chosen this method to have another look at the limestone pay, rather than sink a stepout well. Puri came in at 1,000 bbl. daily from 7,460 ft. several weeks ago, but the well quickly went to water.

The Israeli Government is pursuing talks in Paris in an effort to raise $25 million for a 16-in. loop on the Elath-Beersheba crude pipeline. The line would parallel an existing 8-in. line, which is part of a 235-mile system carrying crude from the Gulf of Aqaba to Haifa refinery. The expanded system would have capacity of 90,000 bbl. daily.

The Journal's Annual

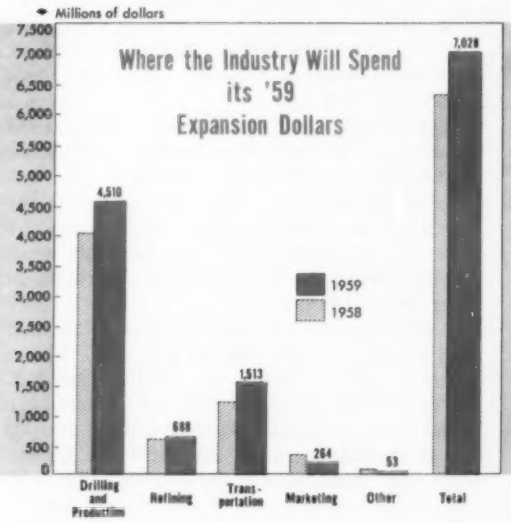
REVIEW FORECAST

THE PETROLEUM INDUSTRY swings back this year to a level of capital expenditures closely approaching record 1957.

An estimated $7.028 billion will be invested in all divisions during 1959, compared with $6.389 billion last year. Drilling and production account for the greatest increase, reflecting a resurgence in field activity. Investment in new refining facilities will increase $70 million from last year, but will still fall far short of the 1957 building boom.

Oil's quickening pulse is evident from this study of 48 companies, a cross-section representing well over 50% of the industry's total operations.

For the underlying factors contributing to this 10% boost in capital investment, turn to the following 50 pages.



Highlights -

Drilling returns to its upward trend in 1959 with 52,746 wells planned, including 10,820 wildcats.

Completions dropped to 49,111 wells in 1958. The wildcat portion was the lowest since 1950.

Income from crude production was off $500,000,000 last year. Record production is on tap for 1959.

Gas production gained 3.0% in 1958, but the net addition to reserves was only 2.3%.

Liquid hydrocarbon reserves gained 562,000,000 bbl., and 84% of the total was in gas liquids.

Domestic demand gains in 1959 will be larger than the average since the end of World War II.

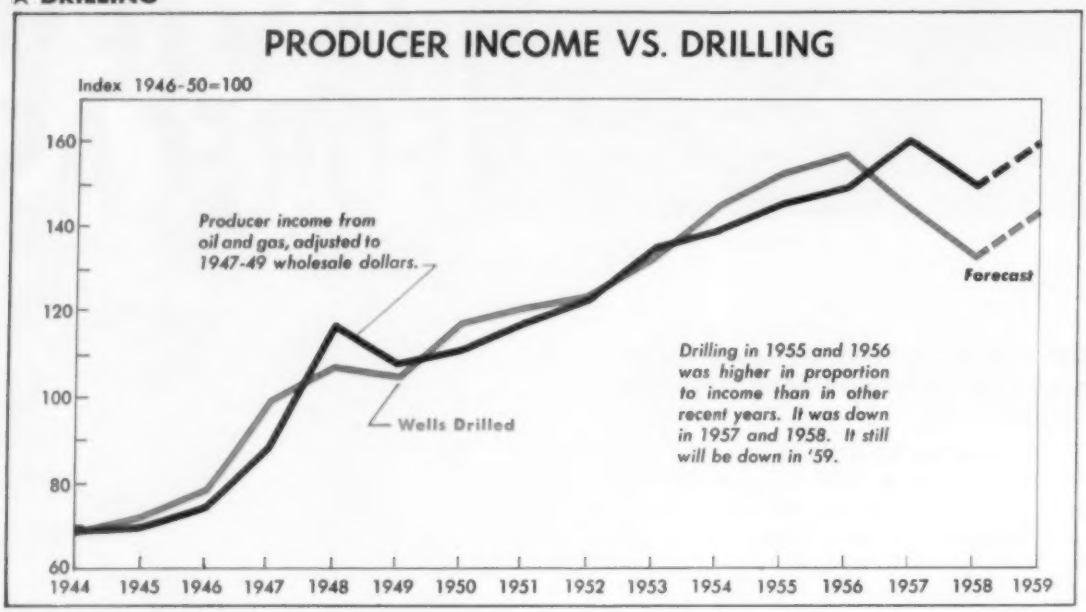
Imports rose to an all-time high in 1958. Product imports more than offset the dip by crude.

Annual refinery runs may top 8,000,000 bbl. daily for the first time in 1959.

Gas-liquids production showed a slight drop in 1958, the first since 1933.

12,500 miles of gas pipelines, programed for 1959, will lead the upturn in construction.

Low discovery rate for past 2 years calls for more adventuresome wildcatting in 1959.


PRODUCER INCOME VS. DRILLING
Index 1946-50=100
160
140
120
100
80
60
Producer income from oil and gas, adjusted to 1947-49 wholesale dollars.
Wells Drilled
Forecast
Drilling in 1955 and 1956 was higher in proportion to income than in other recent years. It was down in 1957 and 1958. It still will be down in '59.
1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959

Journal forecast: 52,746 wells in '59

DRILLING will be up in 1959 after two sharp reductions. Total completions dropped 4,322 wells in 1957 and lost another 4,727 wells in 1958.

Reports from operators in every active state show planned increases for 1959 in the range of 3,500 to 4,000 wells. The Journal's forecast, based on these reports, includes 10,820 wildcats and 41,926 development wells. Projected total completions of 52,746 wells represent a gain of 7.4%.

Operators' plans show larger increases for wildcats than for field wells. The wildcat total for the year will show gain of 12.8% over final tabulations for 1958. Expansion in development drilling will be 6.1% or less than half the percentage gain for wildcats.

These gains are high in comparison with the average annual postwar increase of slightly less than 5%. However, the gain for 1959 is calculated from the very low base that resulted from decreases in 1957 and 1958.

There have been only three annual decreases in drilling in the postwar period. The other was in 1949, but drilling was off less than a thousand wells that year.

Even with the 7.4% gain in total completions in 1959, drilling for the year will be slightly less than in 1953. Part of the gain will be due to a normal increase in need for drilling but a portion of the over-all gain will represent a partial return from subnormal conditions in 1957 and 1958.

The sharp change in drilling, starting with 1957, is shown in the chart. One line represents gross income from crude and natural gas corrected for inflation and the other line shows well completions. Both are plotted as indexes to get them on the same scale.

Note that drilling was above income in 1955 and 1956. The sharp reduction in completions in 1957 dropped the drilling line well below its normal relationship to income. The same condition existed in 1958.

Operators have planned more wells for 1959, but income also will be up for the year. Completions still will be running behind gross income.

Part of the drop in domestic drilling in the past few years has been due to the flow of capital to exploration in foreign areas. The extent to which this capital flow continues will help determine drilling programs of the future.

Operators drilled fewer wells in 1958 than they had planned at the start of the year. The sag in general business conditions in the first half, the small demand gain, and reduced production allowables caused a second look at drilling budgets.

If production gains for 1959 are higher than operators' predictions at the time they prepared drilling budgets, there is a good chance that drilling programs will be increased during the year.

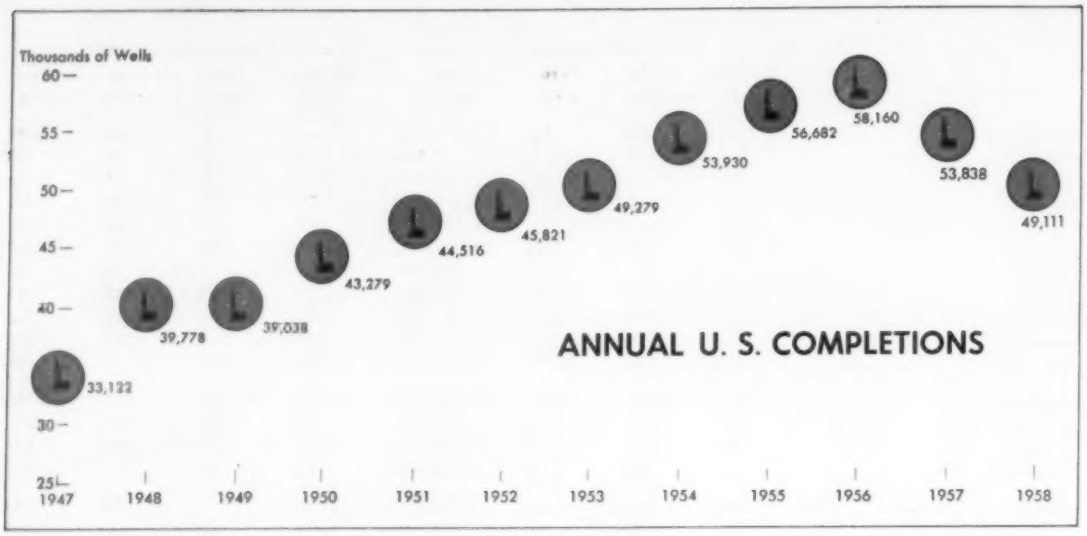
The gain in footage this year will be 8.4% compared with an increase of 7.4% in total wells. Part of the extra gain will be due the larger portion of wildcats in the total. Also, there may be a slight decline in some of the very shallow areas. Unusual activity in a few of these areas in 1958 and the big drop in wildcatting prevented the normal gain in average footage last year.

10,820 wildcats, 41,926 field wells' 214 million feet

	1959 forecast				Change from 1958			
	Wildcat wells	Field wells	Total wells	Total footage	Wildcat wells	Field wells	Total wells	Total footage
Alabama	26	32	58	370,000	–4	–14	–18	–281
Alaska	6	1	7	78,000	2	1	3	28
Arizona	20	3	23	70,000	1	3	4	16
Arkansas	185	726	911	3,008,000	22	53	75	221
California	356	1,186	1,542	7,337,000	–12	78	66	159
Colorado	553	389	942	4,901,000	68	38	106	549
Florida	4	.....	4	38,000	–3	.....	–3	–30
Illinois	524	2,035	2,559	5,810,000	75	65	140	316
Indiana	264	596	860	1,401,000	–43	26	–17	–5
Kansas	970	3,390	4,360	15,315,000	126	212	338	1,250
Kentucky	296	1,680	1,976	2,491,000	120	–281	–161	106
Louisiana	**704**	**3,329**	**4,033**	**31,340,000**	**173**	**337**	**510**	**4,316**
North	265	1,275	1,540	5,587,000	22	134	156	617
South	397	1,691	2,088	21,773,000	136	232	368	3,844
Offshore	42	363	405	3,980,000	15	–29	–14	–145
Michigan	156	298	454	1,256,000	11	7	18	54
Mississippi	190	309	499	4,370,000	16	85	101	809
Montana	141	188	329	1,646,000	5	–14	–9	–86
Nebraska	325	356	681	4,039,000	–23	–24	–47	–270
New Mexico	**309**	**1,763**	**2,072**	**9,634,000**	**43**	**119**	**162**	**765**
West	112	917	1,029	4,389,000	9	83	92	392
East	197	846	1,043	5,245,000	34	36	70	373
New York	43	520	563	856,000	–1	20	19	22
North Dakota	162	261	423	2,699,000	27	–46	–19	–141
Ohio	29	1,118	1,147	2,905,000	6	92	98	197
Oklahoma	838	6,840	7,678	25,575,000	–16	1,340	1,324	4,562
Pennsylvania	45	672	717	2,187,000	19	46	65	224
South Dakota	16	.....	16	50,000	1	.....	1	2
Texas	**4,168**	**14,664**	**18,832**	**78,366,000**	**532**	**235**	**767**	**3,481**
Dist. 1	350	667	1,017	2,684,000	–17	38	21	68
Dist. 2	252	480	732	4,545,000	56	–50	6	74
Dist. 3	306	1,050	1,356	8,977,000	20	16	36	278
Dist. 4	480	975	1,455	7,348,000	129	166	295	1,510
East (5 and 6)	360	867	1,227	5,788,000	28	–21	7	231
Dist. 7-B	747	1,848	2,595	7,210,000	48	–28	20	152
West (7-C and 8)	871	4,290	5,161	25,082,000	165	–157	8	103
Dist. 9	690	3,239	3,929	10,931,000	117	227	344	1,026
Dist. 10	112	1,248	1,360	5,801,000	–14	44	30	39
Utah	96	269	365	2,061,000	12	–30	–18	–91
West Virginia	28	807	835	2,260,000	6	73	79	216
Wyoming	325	488	813	3,835,000	66	–15	51	236
Miscellaneous	41	6	47	75,000	3	–3	.....	–36
Total United States	**10,820**	**41,926**	**52,746**	**213,973,000**	**1,232**	**2,403**	**3,635**	**16,589**

. . . and in Canada, 2,383 wells, 12 million feet

	1959 forecast				Change from 1958			
	Wildcat wells	Field wells	Total wells	Total footage	Wildcat wells	Field wells	Total wells	Total footage
Alberta	430	1,025	1,455	8,026	15	–218	–203	–1,068
Saskatchewan	228	494	722	3,170	19	–80	–61	–269
Manitoba	28	50	78	169	17	–26	–9	–16
British Columbia	86	30	116	649	19	11	30	165
Northwest Territories	12	.....	12	41	5	.....	5	17
Western Canada	784	1,599	2,383	12,055	75	–313	–238	–1,171



Completions drop below 50,000

COMPLETIONS in the United States last year fell below the 50,000 mark for the first time since 1953.

Total well completions were 49,111 in 1958, compared with 53,838 wells in 1957. This was a net drop of 4,727 wells, or 8.8%.

Gas-condensate wells have shown a steady gain since 1956, the first year in which separate figures have been compiled. This classification jumped from 688 in 1957 to 1,125 wells in 1958. Oil-well completions dropped 3,339 during 1958, gas wells were off 238 last year; there were 1,879 fewer dusters during 1958, while service wells (those drilled as water supply, or for water flood) were up 292 in 1958.

Net footage penetrated during 1958 was 197,384,000, in round figures, which was a drop of 11.0%, and 24,517,000 ft. Average well depth also dropped from 4,122 the previous year to 4,019 ft.

California, New Mexico, and Texas were the heaviest losers in total drilling. Texas completions were off 3,287 wells in 1958, of which North Texas (Texas Railroad Commission District 9) was hit the hardest. Total completions in that area were down 971 wells compared with the previous year. West Central Texas, District 7-B, was a heavy loser again, being down 297 wells.

New Mexico's loss of 1,110 wells was all in its southeastern areas. The Four Corners district had an increase in drilling, and accounted for 937 of the total. Over 300 producers were added to the Aneth fields.

Indiana drillers had a general revival and completed 123 more wells in 1958 than in the previous year, while Green County in Kentucky experienced a regular old-time boom in shallow drilling, which increased that state's total completions 642 for the year. This was probably the biggest shallow boom since the development of northeastern Oklahoma. The discovery was made in June, and the rush was on, complete with townlot drilling and no regulations. Reports on completed wells, either oil or dry, were not forthcoming until the latter part of the year.

North Dakota and Utah had their biggest drilling year. Total completions in North Dakota were 442, compared with 316 last year. In Utah the totals were 383 and 267.

Mississippi's total of 398 wells was up slightly over last year, due to the rapid expansion of Little Creek field in Pike and Lincoln counties. Most of the state's other areas had a downturn in drilling.

Little Creek field, opened in January 1958, now covers an area of approximately 15 sq. miles. Much work remains to be done in the field, since long extensions have proved up considerable acreage that has had no in-between drilling.

South Texas Drilling Off

In South Texas, drilling was off generally, with the exception of the Eocene trend which furnished a continuous run of discoveries and subsequent development drilling. The most active spots throughout the year were in Duval and Live Oak counties.

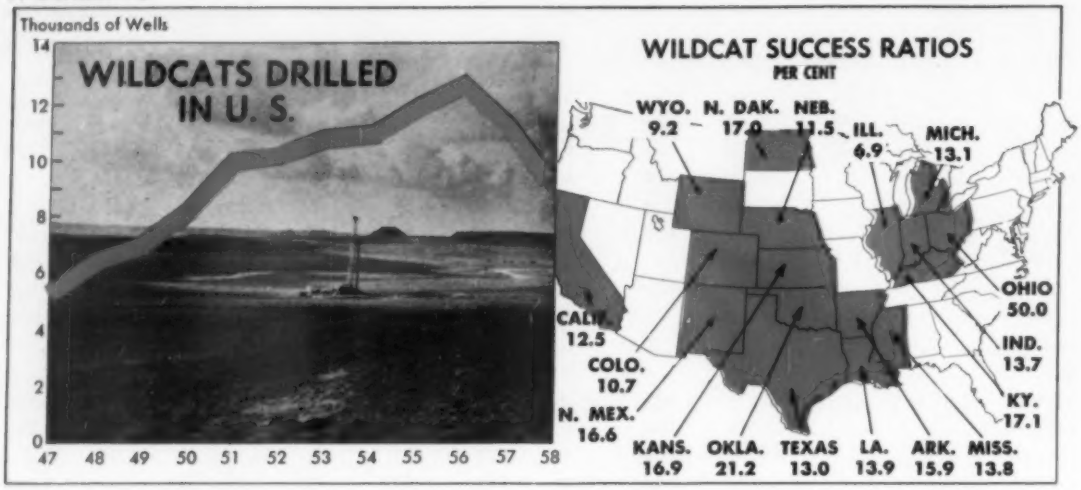
Louisiana offshore operations took a nosedive in 1958, from a high of 120 active operations in 1957, to an average of 35-40 in the year just closed.

Louisiana total completions were 3,523 in 1958, compared with 3,856 the previous year. Completions in the north and south areas held up during the year but total completions for offshore Louisiana dropped from 671 in 1957 to 419 in 1958.

Total completions in California were down 762 wells in 1958, a drop of 34%. The figures represent a general slump in activity in all fields. Operators are confident the picture will change in 1959.

The total count of U. S. completions, by states

	Total	Crude	Cond.	Gas	Dry	Service	Total footage	Average footage	Comp. 1957
Alabama	76	47	0	0	29	0	651,053	8,566	78
Alaska	4	0	0	0	4	0	49,685	12,421	0
Arizona	19	1	0	0	18	0	54,284	2,857	8
Arkansas	836	455	3	37	338	3	2,786,745	3,333	1,114
California	1,476	918	0	39	498	21	7,177,637	4,863	2,238
Colorado	836	149	2	80	605	0	4,351,742	5,205	855
Florida	7	0	0	0	7	0	67,699	9,671	9
Georgia	1	0	0	0	1	0	238	238	2
Idaho	1	0	0	0	1	0	3,003	3,003	2
Illinois	2,419	1,003	0	49	1,272	95	5,493,723	2,271	2,686
Indiana	877	310	0	16	546	5	1,406,005	1,603	754
Kansas	4,022	1,809	9	228	1,858	118	14,065,291	3,497	4,232
Kentucky	2,137	1,224	0	139	767	7	2,385,199	1,116	1,495
Louisiana	3,523	1,616	302	214	1,383	8	27,024,042	7,671	3,856
North	1,384	636	0	178	570	0	4,969,785	3,591	1,447
South	1,720	742	245	29	697	7	17,928,707	10,424	1,738
Offshore	419	238	57	7	116	1	4,125,550	9,846	671
Maryland	2	0	0	1	1	0	8,906	4,453	0
Michigan	436	159	0	27	218	32	1,202,386	2,758	455
Mississippi	398	157	22	2	217	0	3,560,655	8,946	386
Missouri	6	1	0	2	3	0	8,730	1,455	8
Montana	338	159	1	6	171	1	1,732,100	5,125	433
Nebraska	728	215	0	0	513	0	4,309,562	5,920	886
Nevada	1	0	0	0	1	0	745	745	10
New Mexico	1,910	1,012	21	491	380	6	8,869,405	4,644	2,129
New York	544	256	0	15	37	236	833,877	1,533	443
North Dakota	442	254	0	0	188	0	2,840,004	6,425	316
Ohio	1,049	502	0	249	233	65	2,708,325	2,582	1,115
Oklahoma	6,354	3,251	122	340	2,336	305	21,013,445	3,307	6,235
Oregon	1	0	0	0	1	0	7,919	7,919	3
Pennsylvania	652	193	0	281	81	97	1,962,925	3,011	833
South Carolina	1	0	0	0	1	0	450	450	0
South Dakota	15	1	0	0	14	0	47,757	3,184	44
Tennessee	24	1	0	4	19	0	21,841	910	35
Texas	18,065	9,759	642	855	6,465	344	74,885,170	4,145	21,352
Dist. 1	996	409	21	41	523	2	2,615,941	2,626	1,245
Dist. 2	726	195	108	88	333	2	4,470,425	6,158	764
Dist. 3	1,320	510	124	49	625	12	8,699,178	6,590	1,660
Dist. 4	1,160	304	117	83	634	22	5,837,623	5,032	1,417
East (5 & 6)	1,220	617	92	3	506	2	5,556,987	4,555	1,359
Dist. 7-B	2,575	1,165	15	48	1,297	50	7,058,181	2,741	2,872
West (7-C & 8)	5,153	3,937	57	54	1,031	74	24,978,925	4,847	6,072
Dist. 9	3,585	1,958	6	142	1,304	175	9,905,465	2,763	4,556
Dist. 10	1,330	664	102	347	212	5	5,762,445	4,333	1,407
Utah	383	255	1	17	109	1	2,151,762	5,618	267
Virginia	4	0	0	4	0	0	19,711	4,928	12
Washington	6	0	0	0	6	0	38,398	6,400	4
West Virgina	756	114	0	512	122	8	2,044,085	2,704	680
Wyoming	762	316	0	66	379	1	3,599,481	4,724	863
Total 1958	**49,111**	**24,137**	**1,125**	**3,674**	**18,822**	**1,353**	**197,383,985**	**4,019**	**53,838**
Total 1957	**53,838**	**27,476**	**688**	**3,912**	**20,701**	**1,061**	**221,900,539**	**4,122**	.....
Total 1956	**58,160**	**30,730**	**428**	**4,115**	**21,838**	**1,049**	**233,902,000**	**4,022**	.....
Total 1955	**56,682**	**31,567**	.....	**3,613**	**20,742**	**760**	**226,270,000**	**3,992**	.....
Total 1954	**53,930**	**29,773**	.....	**3,977**	**19,168**	**1,012**	**218,986,000**	**4,061**	.....



Wildcats continued to slide in '58

EXPLORATORY DRILLING in 1958 continued its decline . . . a fall that began in early 1957. Oil hunters in the nation's oil provinces dug only 9,588 wildcats compared to 11,739 the previous year. The year's tally shows 920 new oil finds, 158 condensate discoveries, 273 gas strikes, and 8,237 dry wildcats completed. This score compares with 1,172 new oil pools in 1957, 105 condensate strikes, 375 gas finds, and 10,087 dry exploratory attempts. Total wildcat footage drilled in 1958 fell to 44,576,670 ft. compared to 55,794,214 ft. the previous year.

Wildcats accounted for 19.5% of all wells completed in the United States. This compares with 21% in 1957. In 1956 the percentage was 22; in 1955 it was 21.6%; in 1954 it was 20.9%.

. . . **Average wildcat depth** in 1958 was 4,649 ft. compared to 4,750 ft. in 1957. In 1956 it was 4,759 ft.; in 1955 it was 4,804 ft.; in 1954, 4,831 ft.; 4,714 ft. in 1953.

. . . **Success ratio** of all wildcats drilled in 1958 was 11.2% for oil, 2.8% for gas; 86.0% were dry holes. The 1957 success ratio for oil discoveries was 19.9%, 3.3% for gas, and 85.8% were dry holes. The dry-hole ratio is the highest yet.

States with leading success ratios were: North Dakota with 17%, Oklahoma with 16.5, Kentucky with 14.8, Kansas with 14.2, Mississippi with 13.2, New Mexico with 13.2, and Indiana with 12.1% (these are oil-success ratios.)

Exploration—1958

The completion figures don't show it, but the year's exploratory events were widespread and significant. Daring exploratory treks into remote wildcat territories, important new depth records, new oil provinces, reevaluation of older provinces, and some of the decade's most important oil finds highlighted the year's wildcatting.

In Texas . . . Wildcat completions in the Lone Star State dropped from 5,004 to 3,636. This is the biggest decline in many years in Texas wildcatting. However, some of the year's drilling highlights were born in this state. The world's depth record was set, an important new province was opened in the far Southwest as Brown-Bassett, prolific gas-condensate discoveries were noted along the Gulf Coast, while a breakout of exploration was noted up and down the length of the Rio Grande embayment. There

U. S. wildcatting results in '58

	Total	Per Cent Oil*	Per Cent Gas	Per Cent Dry
Texas	3,636	11.4	1.5	87.1
Oklahoma	854	16.5	4.7	78.8
Kansas	844	14.2	2.7	83.1
Illinois	449	5.6	1.3	93.1
Colorado	485	6.6	4.1	89.3
California	368	9.8	2.7	87.5
Louisiana	531	10.5	3.4	86.1
Wyoming	259	4.6	4.6	90.8
New Mexico	266	13.2	3.4	83.4
Nebraska	348	11.5	. . .	88.5
Kentucky	176	14.8	2.3	82.9
Indiana	307	12.1	1.6	86.3
Arkansas	163	9.2	6.7	84.1
Michigan	145	7.6	5.5	86.9
North Dakota	135	17.0	. . .	83.0
Mississippi	174	13.2	0.6	86.2
Others	448	4.9	11.4	83.7
Total 1958	9,588	11.2	2.8	86.0
Total 1957	11,739	10.9	3.3	85.8
Total 1956	13,034	12.4	3.6	84.0
Total 1955	12,271	14.8	2.9	82.3
Total 1954	11,280	14.2	3.5	82.3

*Incl. condensate wells.

1958 completions—wildcats . . . and field wells

	Wildcat completions						Field wells						
	Total	Crude	Cond.	Gas	Dry	Footage	Total	Crude	Cond.	Gas	Dry	Service	Footage
Alabama	30	1	0	0	29	132,129	46	46	0	0	0	0	518,924
Alaska	4	0	0	0	4	49,685							
Arizona	19	1	0	0	18	54,284							
Arkansas	163	12	3	11	137	677,112	673	443	0	26	201	3	2,109,633
California	368	36	0	10	322	1,879,745	1,108	882	0	29	176	21	5,297,892
Colorado	485	31	1	20	433	2,508,916	351	118	1	60	172	0	1,842,826
Florida	7	0	0	0	7	67,699							
Georgia	1	0	0	0	1	238							
Idaho	1	0	0	0	1	3,003							
Illinois	449	25	0	6	418	890,741	1,970	978	0	43	854	95	4,602,982
Indiana	307	37	0	5	265	464,847	570	273	0	11	281	5	941,158
Kansas	844	119	1	23	701	3,216,233	3,178	1,690	8	205	1,157	118	10,849,058
Kentucky	176	26	0	4	146	278,764	1,961	1,198	0	135	621	7	2,106,435
Louisiana	531	38	27	18	448	4,545,348	2,992	1,578	275	196	935	8	22,478,964
North	243	24	0	17	202	1,267,014	1,141	612	0	161	368	0	3,702,771
South	261	11	22	1	227	2,966,433	1,459	731	223	28	470	7	14,962,274
Offshore	27	3	5	0	19	311,901	392	235	52	7	97	1	3,813,649
Michigan	145	11	0	8	126	419,405	291	148	0	19	92	32	782,981
Mississippi	174	20	3	1	150	1,539,314	224	137	19	1	67	0	2,021,341
Missouri	5	0	0	2	3	7,354	1	1	0	0	0	0	1,376
Montana	136	11	1	5	119	626,260	202	148	0	1	52	1	1,105,840
Nebraska	348	40	0	0	308	2,018,927	380	175	0	0	205	0	2,290,635
Nevada	1	0	0	0	1	745							
New Mexico	266	30	5	9	222	1,364,516	1,644	982	16	482	158	6	7,504,889
West	103	9	3	4	87	422,603	834	313	8	464	49	0	3,574,510
East	163	21	2	5	135	941,913	810	669	8	18	109	6	3,930,379
New York	44	0	0	7	37	162,529	500	256	0	8	0	236	671,348
North Dakota	135	23	0	0	112	787,738	307	231	0	0	76	0	2,052,266
Ohio	23	4	0	7	12	86,818	1,026	498	0	242	221	65	2,621,507
Oklahoma	854	116	25	40	673	3,605,217	5,500	3,135	97	300	1,663	305	17,408,228
Oregon	1	0	0	0	1	7,919							
Pennsylvania	26	1	0	9	16	155,839	626	192	0	272	65	97	1,807,086
South Carolina	1	0	0	0	1	450							
South Dakota	15	1	0	0	14	47,757							
Tennessee	22	0	0	4	18	20,056	2	1	0	0	1	0	1,785
Texas	3,636	324	91	55	3,166	17,020,365	14,429	9,435	551	800	3,299	344	57,864,805
Dist. 1	367	15	0	3	349	912,515	629	394	21	38	174	2	1,703,426
Dist. 2	196	13	16	9	158	1,305,192	530	182	92	79	175	2	3,165,233
Dist. 3	286	17	17	5	247	2,501,858	1,034	493	107	44	378	12	6,197,320
Dist. 4	351	21	24	6	300	1,916,178	809	283	93	77	334	22	3,921,445
East	332	8	13	0	311	1,661,558	888	609	79	3	195	2	3,895,429
Dist. 7-B	699	83	4	10	602	2,156,207	1,876	1,082	11	38	695	50	4,901,974
West	706	92	5	9	600	3,656,278	4,447	3,845	52	45	431	74	21,322,647
Dist. 9	573	63	0	6	504	2,016,980	3,012	1,895	6	136	800	175	7,888,485
Dist. 10	126	12	12	7	95	893,599	1,204	652	90	340	117	5	4,868,846
Utah	84	1	1	4	78	470,073	299	254	0	13	31	1	1,681,689
Washington	6	0	0	0	6	38,398							
West Virginia	22	0	0	13	9	128,541	734	114	0	499	113	8	1,915,544
Wyoming	259	12	0	12	235	1,299,705	503	304	0	54	144	1	2,299,776
Virginia							4	0	0	4	0	0	19,711
Maryland							2	0	0	1	1	0	8,906
Total 1958	**9,588**	**920**	**158**	**273**	**8,237**	**44,576,670**	**39,523**	**23,217**	**967**	**3,401**	**10,585**	**1,353**	**152,807,315**
Total 1957	11,739	1,172	105	375	10,087	55,794,214	42,099	26,304	583	3,537	10,614	1,061	166,106,325

were extensions to the famed Edwards trend plus a pickup in Wilcox drilling in South Texas.

In Oklahoma . . . Perhaps the most successful wildcatting year in Sooner history was 1958. The northwestern part of the Anadarko basin bore the brunt of this wildcat frontal attack. The Pennsylvanian and Mississippian rocks became big targets in 1958 throughout the Panhandle and northwestern counties. The so-called Woodward trend became an entire new oil and gas province for the state. Deep Ordovician production in South-Central Oklahoma rounded out a banner year for the state. The world's second deepest hole was dug at Elk City in 1958, going to 24,002 ft.

In Kansas . . . The nation's newest oil province cropped up in the northwestern corner of this state. Pennsylvanian production was opened during the year in the remote four-county area bordering Colorado and Nebraska, giving rise to a big push into the untapped potential of the huge Las Animas arch.

The Rockies . . . Exploratory attempts in the Rocky Mountain states were rewarding everywhere. Wyoming, the Four Corners, Williston, and Denver basin highlighted the year's success tale. North Dakota enjoyed its biggest wildcat and development-drilling year in its short oil history. New fields were tapped up and down the flanks of the Nesson anticline as well as in northern and northeastern counties. Montana's big push was along the Disturbed belt, on the Central Plains, and in the Cut Bank area. Both Nebraska and Colorado recorded important new Denver basin fields, while the San Juan basin traded places with the Paradox in discoveries. Oddly enough, the big story in the Paradox basin was a dry hole . . . Tennessee Gas Transmission Co. uncovered a Pennsylvanian reef on the northwest side of the basin. This find is probably the most important "dry hole" since the discovery of the Pescadito salt dome in 1957.

All of Wyoming's basins got into the act in 1958, but the Green River, Red Desert, Powder River,

Completions by month and by type of production

Wildcat Completions

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Oil	87	70	58	56	85	79	111	61	89	75	74	75
Cond.	13	9	11	13	19	9	16	16	18	10	7	17
Gas	48	22	19	11	22	22	20	24	16	16	24	29
Dry	919	564	533	475	735	677	744	638	782	770	724	676
Total	1,067	665	621	555	861	787	891	739	905	871	829	797

Development Completions

Oil	2,369	1,703	1,632	1,472	1,957	1,817	2,039	1,813	2,059	1,978	2,225	2,153
Cond.	103	69	60	83	99	75	85	84	78	57	81	93
Gas	314	247	290	195	257	259	344	319	286	310	319	261
Dry	1,038	693	722	659	920	866	911	845	973	913	959	1,086
Service	97	74	104	63	96	99	146	95	140	121	165	153
Total	3,921	2,786	2,808	2,472	3,329	3,116	3,525	3,156	3,536	3,379	3,749	3,746

Total Completions

Oil	2,456	1,773	1,690	1,528	2,042	1,896	2,150	1,874	2,148	2,053	2,299	2,228
Cond.	116	78	71	96	118	84	101	100	96	67	88	110
Gas	362	269	309	206	279	281	364	343	302	326	343	290
Dry	1,957	1,257	1,255	1,134	1,655	1,543	1,655	1,483	1,755	1,683	1,683	1,762
Service	97	74	104	63	96	99	146	95	140	121	165	153
Total	4,988	3,451	3,429	3,027	4,190	3,903	4,416	3,895	4,441	4,250	4,578	4,543

Footage (Thousands)

Wildcat	5,038	3,070	2,908	2,665	4,240	3,630	4,047	3,432	4,123	3,957	3,609	3,857
Development	16,064	11,567	11,319	10,585	13,570	12,412	13,519	11,737	12,798	12,402	13,764	13,070
Total	21,102	14,637	14,227	13,250	17,810	16,042	17,566	15,169	16,921	16,359	17,373	16,927

and Wind River made the headlines. The Green River basin is finally emerging as a major new gas province . . . a birth that has been eagerly awaited for the past 10 years or more. Several important gas reservoirs were opened . . . Desert Springs, Wamsutter, Red Desert. The big oil strike of the year in Wyoming was at O'Brien Springs where good Pennsylvanian production was found. Pennsylvanian discoveries also highlighted wildcat news in in the Powder River basin.

In California . . . The best oil find in the nation and on the West Coast is credited to California explorers. The offshore oil strike at Summerland, off Santa Barbara County, set off a long-needed push into Pacific Ocean waters. We will see a big year in California offshore work in 1959. Other important oil finds were put on the records in the San Joaquin Valley.

The Southeast . . . Exploration in the southeastern states of Arkansas, Louisiana, Mississippi, and Alabama was quite newsworthy in 1958. Jurassic strikes in Mississippi, extenions to Citronelle, and big additions to the Lower Cretaceous fields in southern Mississippi led the parade of strikes in the southeastern region. Gas exploration in Arkansas' McAlester-Arkansas Valley basin was stepped up in 1958. Louisiana had a big year in new oil finds . . onshore. Offshore exploration netted only 8 new finds.

In the East . . . Drilling in the eastern states was at its highest pitch in many years. Ohio, Pennsylvania, West Virginia, and New York all reported good years. The big story, however, was the emergence of Green County in Central Kentucky as a major shallow oil field. More than 700 shallow wells were completed here in 1958, capturing the interest of the entire oil nation.

Total well completions for western Canada

	All wells						Total	Wildcats				
	Total	Oil	Gas	Dry	Service	Footage	1957	Total	Oil	Gas	Dry	Footage
Alberta	1,658	990	175	417	76	9,094,303	1,434	415	48	52	315	2,486,864
Saskatchewan	783	515	16	251	1	3,438,516	1,199	209	35	5	169	918,471
Manitoba	87	62	0	25	0	184,634	222	11	1	0	10	25,416
British Columbia	86	14	26	46	0	484,633	92	67	4	22	41	391,996
N. W. T.	7	0	0	7	0	24,101	3	7	0	0	7	24,101
Western Canada	**2,621**	**1,581**	**217**	**746**	**77**	**13,226,187**	2,950	709	88	79	542	3,846,848

1958 footage breakdown

	FIELD WELLS					WILDCAT WELLS			
	Oil	Cond.	Gas	Dry	Service	Oil	Cond.	Gas	Dry
Alabama	518,924	.....	.....	.....	.....	11,800	.....	.....	120,329
Alaska	.....	.....	.....	.....	.....	.....	.....	.....	49,685
Arizona	.....	.....	.....	.....	.....	5,410	.....	.....	48,874
Arkansas	1,226,748	.....	141,655	735,190	6,040	63,575	25,932	67,369	520,236
California	4,190,617	.....	155,712	877,785	73,778	272,259	.....	48,015	1,559,471
Colorado	615,085	5,450	344,556	887,735	.....	168,928	5,609	109,956	2,224,423
Florida	.....	.....	.....	.....	.....	.....	.....	.....	67,699
Georgia	.....	.....	.....	.....	.....	.....	.....	.....	238
Idaho	.....	.....	.....	.....	.....	.....	.....	.....	3,003
Illinois	2,334,891	.....	26,742	2,066,453	174,896	60,487	.....	4,953	825,301
Indiana	470,097	.....	10,046	455,657	5,358	55,614	.....	8,034	401,199
Kansas	5,566,539	42,982	827,510	4,027,969	384,058	464,115	5,353	116,616	2,630,149
Kentucky	980,515	.....	359,574	759,579	6,767	40,941	.....	5,758	232,065
Louisiana	10,803,433	3,405,889	1,009,918	7,229,651	29,803	299,531	346,106	145,813	3,753,898
North	1,663,048	.....	617,758	1,421,965	.....	138,034	.....	140,238	988,742
South	6,964,420	2,793,307	325,312	4,852,852	26,383	130,723	284,622	5,575	2,545,513
Offshore	2,175,965	612,582	66,848	954,834	3,420	30,774	61,484	.....	219,643
Michigan	429,339	.....	47,267	263,207	43,168	30,203	.....	19,335	369,867
Missouri	1,376	.....	.....	.....	.....	.....	.....	921	6,433
Mississippi	1,307,561	153,674	4,796	555,310	.....	202,788	33,816	5,137	1,297,573
Montana	858,472	.....	.....	245,699	1,669	60,644	12,185	18,933	534,498
Nebraska	1,065,306	.....	.....	1,225,329	.....	245,246	.....	.....	1,773,681
Nevada	.....	.....	.....	.....	.....	.....	.....	.....	745
New Mexico	4,589,105	141,151	2,102,936	660,057	11,640	191,882	53,825	58,737	1,060,072
New York	324,600	.....	22,148	.....	324,600	.....	.....	23,073	139,456
North Dakota	1,557,807	.....	.....	494,459	.....	178,180	.....	.....	609,558
Ohio	1,376,195	.....	623,144	467,135	155,033	15,347	.....	27,026	44,445
Oklahoma	9,761,265	706,163	1,416,886	4,888,274	635,640	674,344	225,789	217,280	2,487,804
Oregon	.....	.....	.....	.....	.....	.....	.....	.....	7,919
Pennsylvania	308,979	.....	1,054,605	273,914	169,588	3,886	.....	57,957	93,996
South Carolina	.....	.....	.....	.....	.....	.....	.....	.....	450
South Dakota	.....	.....	.....	.....	.....	8,645	.....	.....	39,112
Tennessee	485	.....	.....	1,300	.....	.....	.....	2,955	17,101
Texas	36,764,652	4,567,169	3,294,425	12,453,979	784,580	1,759,840	786,048	335,373	14,139,104
Dist. 1	863,835	207,598	189,575	441,180	1,238	66,507	.....	12,636	833,372
Dist. 2	1,009,237	740,092	371,568	1,035,952	8,384	88,348	133,633	46,582	1,036,629
Dist. 3	2,842,198	1,059,551	223,325	2,024,759	47,487	159,475	172,604	38,686	2,131,093
Dist. 4	1,189,517	734,072	294,124	1,646,324	57,408	112,409	210,874	31,405	1,561,490
East	2,432,976	542,313	21,821	896,769	1,550	46,091	98,760	.....	1,516,707
Dist. 7-B	2,846,855	52,214	120,604	1,780,611	101,690	299,654	14,688	26,631	1,815,234
West	18,452,432	480,700	222,106	1,953,969	213,440	599,222	45,345	98,321	2,913,390
Dist. 9	4,656,078	31,261	810,040	2,050,700	340,406	289,966	.....	30,242	1,696,772
Dist. 10	2,471,524	719,368	1,041,262	623,715	12,977	98,168	110,144	50,870	634,417
Utah	1,468,669	.....	48,923	158,023	6,074	5,585	6,031	17,882	440,575
Virginia	.....	.....	19,711	.....	.....	.....	.....	.....	.....
Washington	.....	.....	.....	.....	.....	.....	.....	.....	38,398
West Virginia	244,716	.....	1,375,072	278,896	16,770	.....	.....	70,660	57,881
Wyoming	1,364,912	.....	349,251	576,157	9,456	75,336	.....	86,075	1,138,294
Maryland	.....	.....	4,456	4,450	.....	.....	.....	.....	.....
Total U. S.	88,130,288	9,022,478	13,229,333	39,586,298	2,838,918	4,894,586	1,500,694	1,447,858	36,733,532

1958 condensate, service-well depth breakdown

	FIELD-CONDENSATE									WILDCAT-CONDENSATE								SERVICE WELLS					
	A	B	C	D	E	F	G	H	I	B	C	D	E	F	G	H	I	A	B	C	D	E	F
Colorado	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Kansas	..	..	..	4	4	..	..	..	..	..	..	..	1	..	..	..	..	5	11	66	33	3	..
Louisiana	..	..	2	..	6	37	94	89	47	..	..	..	..	2	8	14	3	..	1	6	..	..	1
Mississippi	..	..	..	5	1	10	3	..	..	..	..	..	..	2	..	1	..	..	..	..	..	..	..
New Mexico	..	..	..	..	8	5	..	3	..	..	..	..	3	..	..	..	2	..	6	..	..	..	..
Oklahoma	..	..	7	14	42	23	5	2	4	..	1	..	7	11	3	..	3	66	134	89	11	5	..
Texas	..	2	5	28	157	233	114	12	..	1	1	6	13	47	21	2	..	95	110	98	31	8	2
Dist. 1	..	..	..	..	1	6	14	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..
Dist. 2	..	..	2	3	28	48	11	..	..	..	..	1	3	11	1	..	..	..	..	1	1	..	..
Dist. 3	..	..	..	..	13	39	51	4	..	..	..	..	1	7	7	2	..	..	2	7	1	..	2
Dist. 4	..	..	..	2	37	42	11	1	..	..	..	..	5	14	5	..	..	1	2	19	..	..	..
East	..	..	1	12	40	25	..	1	..	..	..	2	3	6	2	..	..	2	..	..	..	..	..
Dist. 7-B	..	1	..	4	6	..	..	..	..	1	..	3	..	..	..	..	..	19	15	5	10	1	..
West	..	1	..	5	14	4	22	6	..	..	1	..	..	1	3	..	..	1	24	35	10	4	..
Dist. 9	..	..	2	..	4	..	..	..	..	..	..	..	..	..	..	..	..	70	66	27	9	3	..
Dist. 10	..	..	..	2	14	69	5	..	..	..	..	..	1	8	3	..	..	..	1	4	..	..	..
Arkansas	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	2	1	..	..	..
Montana	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..
Utah	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..
California	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	2	2	7	5	..
Illinois	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	21	56	18	..	..	..
Indiana	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	1	..	..	..	..
Kentucky	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	1	..	..	..	..
Michigan	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	23	..	..	..	..
New York	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	236	..	..	..	..
Ohio	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	43	22	..	..	..
Pennsylvania	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	25	71	1	..	..	..
West Virginia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	1	..	..	..
Wyoming	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Total U. S.	2	14	51	219	308	216	106	51	1	2	6	26	65	33	17	8	236	705	304	82	22	4

NOTE: A = 0-1,250 ft.; B = 1,250-2,500 ft.; C = 2,500-3,750 ft.; D = 3,750-5,000 ft.; E = 5,000-7,500 ft.; F = 7,500-10,000 ft.; G = 10,000-12,500 ft.; H = 12,500-15,000 ft.; I = 15,000 ft.

1958 wildcat depth breakdown

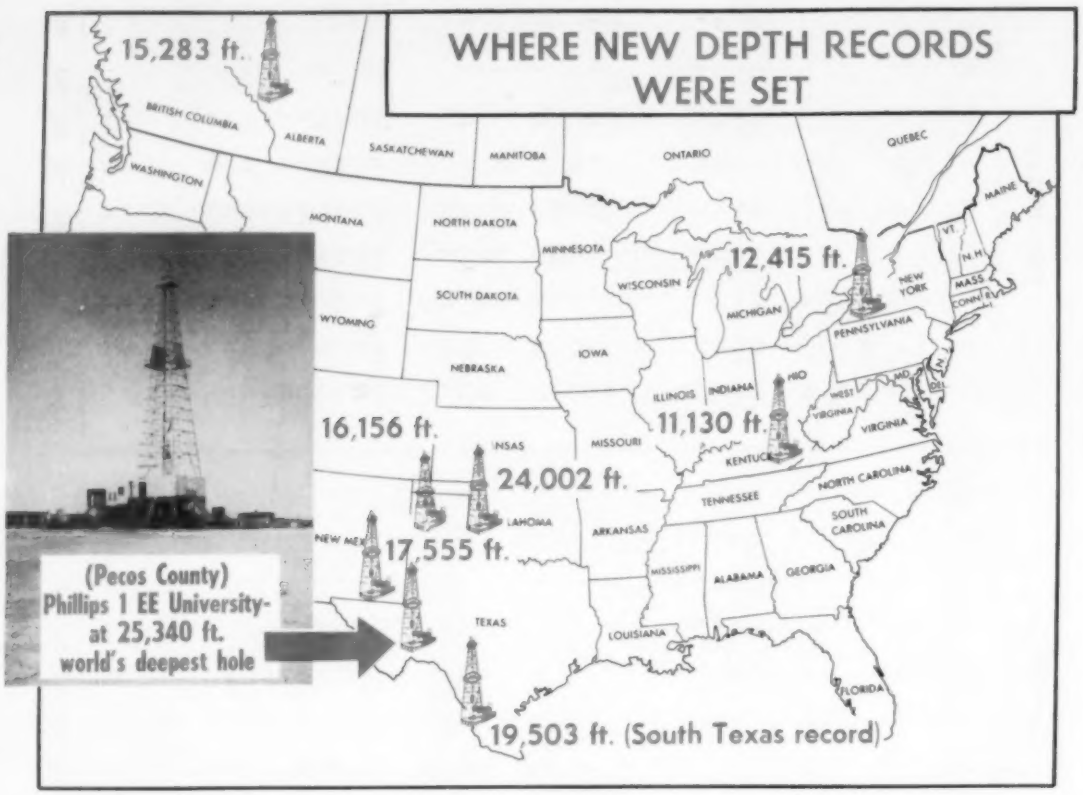
	OIL DISCOVERIES									GAS STRIKES									DRY HOLES								
	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I
Alabama	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	4	13	...	2	2	5	2	1	...
Alaska	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	1	...
Arizona	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	6	5	2	2	3	...	...	...	...
Arkansas	...	...	4	2	3	3	...	...	...	...	...	1	2	5	3	...	...	...	4	18	69	19	21	4	2	...	...
California	3	2	5	2	3	9	8	4	...	1	...	4	2	1	1	1	...	...	46	43	56	44	69	30	23	11	...
Colorado	...	...	2	5	24	...	...	...	...	...	1	...	8	9	2	...	...	...	17	19	20	105	254	17	...	1	...
Florida	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	3	1	...
Georgia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Idaho	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Illinois	4	8	12	1	...	...	...	...	...	5	...	1	...	...	...	...	...	...	106	178	129	4	1	...	...	...	...
Indiana	14	21	2	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	117	124	24	...	...	...	...	...	...
Kansas	...	6	46	55	12	...	...	...	...	...	...	2	10	11	...	...	...	...	5	49	299	295	53	...	...	...	...
Kentucky	5	18	3	...	...	...	...	...	...	2	1	1	...	...	...	...	...	...	44	90	11	...	1	...	...	...	...
Louisiana	...	...	4	6	11	6	5	5	1	...	...	2	1	3	9	2	1	...	6	12	72	35	75	60	107	52	29
North	...	...	4	6	10	3	1	...	...	...	...	2	1	2	9	2	1	...	6	10	62	34	66	21	3	...	...
South	...	...	...	...	1	1	4	4	1	...	...	...	...	1	...	...	...	...	...	2	10	1	5	39	97	44	29
Offshore	...	...	...	...	...	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	7	8	...
Michigan	...	6	3	2	...	...	...	...	...	1	4	2	1	...	...	...	...	...	8	37	59	21	1	...	...	...	...
Missouri	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	1	1	1	...	...	...	...	...	...
Mississippi	...	...	...	1	7	...	7	4	1	...	...	...	...	1	...	...	...	...	1	...	1	8	60	26	32	19	3
Montana	...	2	3	...	3	2	1	...	...	1	...	1	2	1	...	...	...	...	7	21	26	22	30	6	7	...	...
Nebraska	...	...	1	2	37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	11	53	241	1	...	...	...
Nevada	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
New Mexico	2	5	1	5	8	2	3	4	...	1	2	...	1	2	...	2	...	1	19	40	34	38	59	10	11	10	1
New York	...	...	...	...	...	...	...	...	...	...	1	3	3	...	...	...	...	...	...	2	11	24	...	...	...	...	...
North Dakota	...	...	2	3	6	9	2	1	...	...	...	...	...	...	...	...	...	...	...	2	38	22	27	17	4	2	...
Ohio	...	...	2	2	...	...	...	...	...	...	...	2	5	...	...	...	...	...	...	2	1	9	...	...	...	...	...
Oklahoma	4	8	19	20	35	19	10	...	1	4	2	1	7	21	4	1	...	...	167	98	116	91	128	61	8	2	2
Oregon	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Pennsylvania	...	...	...	1	...	...	...	...	...	...	...	...	...	6	3	...	...	...	...	...	2	3	7	4	...	...	...
South Carolina	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
South Dakota	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	4	4	1	3	2	...	...	...	...
Tennessee	...	...	...	...	...	...	...	...	...	3	1	...	...	...	...	...	...	...	15	3	...	...	...	...	...	...	...
Texas	9	38	51	57	94	48	22	5	...	3	4	11	8	14	7	3	2	3	268	690	513	512	706	347	101	24	5
Dist. 1	3	1	4	...	5	...	1	1	...	...	...	2	...	1	...	...	...	...	101	117	66	31	29	3	2	...	...
Dist. 2	...	...	...	3	5	4	1	...	...	...	...	3	3	1	2	...	...	...	4	5	12	24	49	53	11	...	...
Dist. 3	...	...	...	...	1	10	5	1	...	...	...	...	...	3	1	1	...	...	1	2	4	6	58	140	30	3	3
Dist. 4	1	1	6	1	6	6	...	...	...	...	1	1	...	3	1	...	...	...	20	35	52	37	91	48	14	2	1
East	...	1	1	...	4	2	...	...	...	...	...	...	...	...	...	...	...	...	20	38	21	64	138	24	6	...	...
Dist. 7-B	2	24	20	17	20	...	...	...	...	2	2	2	4	...	...	...	...	...	69	219	127	97	89	1	...	...	...
West	1	6	7	20	25	19	11	3	...	1	...	1	...	1	...	1	2	3	25	102	108	133	140	43	30	19	...
Dist. 9	1	5	12	16	28	1	...	...	...	...	1	...	1	4	...	...	...	...	24	170	107	110	91	2	...	...	...
Dist. 10	1	...	1	...	...	6	4	...	...	...	...	2	...	1	3	1	...	...	4	2	16	10	21	33	8	...	1
Utah	...	...	...	...	1	...	...	...	...	1	...	...	...	3	...	...	...	...	1	9	7	6	43	9	2	1	...
Washington	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	1	...	...	...
West Virginia	...	...	...	...	...	...	...	...	...	...	...	1	4	8	...	...	...	...	...	...	1	1	5	2	...	...	...
Wyoming	1	...	...	2	7	1	1	...	...	...	1	1	1	4	3	1	...	1	29	36	26	32	66	38	6	2	...
Total United States	**42**	**114**	**160**	**166**	**252**	**100**	**60**	**23**	**3**	**24**	**22**	**33**	**55**	**89**	**32**	**10**	**3**	**5**	**878**	**1,498**	**1,531**	**1,351**	**1,862**	**639**	**311**	**127**	**40**

NOTE: A = 0-1,250 ft.; B = 1,250-2,500 ft.; C = 2,500-3,750 ft.; D = 3,750-5,000 ft.; E = 5,000-7,500 ft.; F = 7,500-10,000 ft.; G = 10,000-12,500 ft.; H = 12,500-15,000 ft.; I = 15,000 ft.

1958 field-well depth breakdown

	OIL WELLS									GAS WELLS									DRY HOLES								
	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I
Alabama	...	...	...	...	2	...	43	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Arkansas	11	268	113	29	16	6	...	...	...	...	2	4	3	15	2	...	...	...	1	25	120	27	21	7	...	...	...
California	112	168	157	129	126	86	66	34	4	...	1	5	4	18	1	...	...	...	19	31	30	16	47	17	11	4	1
Colorado	1	3	10	25	76	3	...	...	...	1	1	1	7	48	2	...	...	...	6	5	7	43	109	2	...	...	...
Illinois	131	324	509	14	...	...	...	...	...	38	5	...	...	...	...	...	...	...	116	259	475	4	...	...	...	...	...
Indiana	66	166	40	1	...	...	...	...	...	10	1	...	...	...	...	...	...	...	89	171	21	...	...	...	...	...	...
Kansas	...	376	852	420	42	...	...	...	...	...	12	70	88	35	...	...	...	...	5	132	625	355	40	...	...	...	...
Kentucky	936	233	26	3	...	...	...	...	...	16	48	42	25	4	...	...	...	...	367	206	47	1	...	...	...	...	...
Louisiana	75	353	146	45	176	343	285	127	28	11	71	25	3	25	32	17	11	1	29	88	161	62	99	142	201	115	38
North	60	323	122	23	73	8	3	...	...	11	71	25	3	23	25	3	...	...	19	69	146	42	61	22	8	1	...
South	15	30	24	22	62	221	220	112	25	...	...	...	...	2	4	10	11	1	6	18	15	17	27	94	161	98	34
Offshore	...	...	...	...	41	114	62	15	3	...	...	...	...	...	3	4	...	...	4	1	...	3	11	26	32	16	4
Maryland	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...
Michigan	1	53	57	33	4	...	...	...	...	1	11	2	4	1	...	...	...	...	3	27	47	12	3	...	...	...	...
Missouri	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mississippi	...	...	...	7	32	17	68	12	1	...	...	...	1	...	...	...	...	...	...	...	...	9	28	6	20	3	1
Montana	1	33	25	9	16	63	1	...	...	1	...	...	...	...	...	...	...	...	1	17	8	4	10	12	...	...	...
Nebraska	...	...	3	16	156	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	4	22	176	...	...	...	...
New Mexico	8	134	208	294	228	39	63	8	...	3	66	138	81	181	11	1	1	...	20	26	41	34	16	7	13	1	...
New York	...	256	...	...	...	...	...	...	...	...	5	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
North Dakota	...	...	78	3	39	93	17	1	...	...	...	...	...	...	...	...	...	...	...	...	19	5	24	26	1	1	...
Ohio	90	25	368	15	...	...	...	...	...	41	61	104	35	1	...	...	...	...	80	40	80	21	...	...	...	...	...
Oklahoma	500	944	815	363	322	166	24	1	...	11	63	34	45	126	21	...	...	...	412	423	357	195	181	76	13	3	3
Pennsylvania	9	180	3	...	...	...	...	...	...	...	4	179	36	50	3	...	...	...	3	22	19	3	16	2	...	...	...
Tennessee	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Texas	1,041	1,813	2,886	1,262	1,623	587	179	43	1	9	214	237	79	203	41	13	4	...	468	846	602	471	572	270	55	15	...
Dist. 1	109	137	106	29	13	...	...	...	...	2	2	19	4	1	2	8	...	...	46	64	34	12	11	4	2	1	...
Dist. 2	7	4	30	31	74	35	1	...	...	...	4	29	19	17	9	1	...	...	3	8	29	38	36	58	3	...	...
Dist. 3	35	37	75	63	115	147	19	1	1	3	1	8	9	17	4	2	...	...	48	39	57	34	85	88	21	6	...
Dist. 4	26	44	76	28	86	23	...	...	...	2	12	33	14	14	1	...	1	...	25	44	56	41	116	41	9	2	...
East	131	86	121	45	176	48	1	1	...	...	...	...	...	2	1	...	...	...	29	18	21	25	86	15	1	...	...
Dist. 7-B	242	389	159	189	103	...	...	...	...	...	10	15	10	3	...	...	...	...	156	254	118	105	62	...	...	...	...
West	41	267	1,596	646	825	273	156	41	...	1	2	18	8	11	1	1	3	...	26	69	94	105	82	34	15	6	...
Dist. 9	450	806	225	224	187	3	...	...	...	...	2	2	2	130	...	...	...	...	135	339	148	104	74	...	...	...	...
Dist. 10	...	43	498	7	44	58	2	...	...	1	181	113	13	8	23	1	...	...	...	11	45	7	20	30	4	...	...
Utah	...	...	...	...	253	1	...	...	...	2	...	5	1	5	...	...	...	...	1	1	4	1	24	...	...	...	...
Virginia	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
West Virginia	2	80	32	...	...	...	...	...	...	3	269	108	109	10	...	...	...	...	6	67	25	14	1	...	...	...	...
Wyoming	47	22	58	69	65	38	4	1	...	...	2	13	...	9	29	1	...	...	37	15	24	16	33	17	1	1	...
Total United States	**3,032**	**5,432**	**6,386**	**2,737**	**3,176**	**1,442**	**750**	**228**	**34**	**147**	**836**	**970**	**526**	**731**	**142**	**32**	**16**	**1**	**1,663**	**2,495**	**2,716**	**1,316**	**1,400**	**584**	**315**	**143**	**43**

NOTE: A = 0-1,250 ft.; B = 1,250-2,500 ft.; C = 2,500-3,750 ft.; D = 3,750-5,000 ft.; E = 5,000-7,500 ft.; F = 7,500-10,000 ft.; G = 10,000-12,500 ft.; H = 12,500-15,000 ft.; I = 15,000 ft.



Depth history was made in '58

DEEP WILDCATTING in 1958 broke the world's drilling-depth record with a history-making Pecos County, Texas, well going below 25,000 ft. This wildcat startled the industry by hitting the ultra-deep mark unheard of a couple of years back. Phillips Petroleum Co.'s 1-EE University is the well.

Drilling-depth records were broken in eight other U. S. and Canadian areas during the year . . . Oklahoma, Southwest Texas, Southeast New Mexico, the Texas Panhandle, Alberta, Alaska, New York, and Kentucky.

Producing-depth records fell by the wayside in four areas . . . Wyoming, Mississippi, North Dakota, and Western Canada's Alberta.

Depth Records Shattered

. . . In West Texas, Phillips Petroleum Co.'s 1-EE University wildcat in Pecos County not only broke the West Texas and Texas depth records, but went on down below 25,000 ft. to set a new world depth to shoot at. The news-making and history-making well never got out of the wildcat news during the year. Each week's developments were watched closely by the industry. Several other wildcats in the area also plunged down toward the below-20,000-ft. mark.

. . . In Oklahoma, the world's second-deepest hole is in Oklahoma's Elk City field at Shell Oil Co. 5 Rumberger. This one went to 24,002 ft. into the Chester-Mississippian.

. . . In Southwest Texas, not only was first production opened on the huge Pescadito salt dome in Webb County, but also the deepest hole in this part of Texas. Ginther et al. 1-A Killam went to 19,503 ft. into Lower Cretaceous rocks. This well was part of the program that opened this salt dome to production earlier in the year.

. . . In Canada, Alberta now has our northern neighbor's deepest hole. Texaco 8-28 Simonette River dug down to 15,283 ft. to set a new Canadian record. Earlier, a well at Lambert Creek held the title; before Lambert Creek (also in Alberta) the deepest hole in the country was in the Maritimes' Prince Edward Island.

Deeper production was opened in four areas in 1958. Some of the new record-holders will go down in oil history not only for their depths but for their potentials, pay zones, and future prospects.

. . . In Wyoming, the deepest producer in the state and in the entire Rocky Mountain region, is Pure Oil Co.'s 1 Badwater Unit on the north side of the complex Wind River basin. This well found gas production in Upper Cretaceous rocks at 16,-472 ft.

Here are the U. S. and Canadian producing-depth records

State or area—	Well and location; county—	Result	Year comp.	Pay zone	Prod. depth
South Louisiana	Richardson & Bass et al. 1-L Humble LL&E, 35-19s-27e; Plaquemines	Oil	1956	Miocene	21,443
California	Richfield 67-29 Coles Levee, North Coles Levee; Kern (not producing)	Cond.	1953	Eocene	17,892
Oklahoma	British-American 1 Krieger, Knox field; Stephens	Cond.	1957	Ordovician	16,546
Wyoming	Pure 1 Badwater Unit, 35-39n-89w; Natrona	Gas	1958	U. Cretaceous	16,472
Mississippi	Gulf 1 Z. B. Soso Field Unit, 28-10n-13w; Jasper	Oil	1958	Jurassic	15,256
New Mexico, S.E.	Continental 1-A Bell Lake, 31-23s-34e; Lea	Gas	1955	Devonian	15,025
West Texas	Phillips 1-E Puckett, Glenna pool; Pecos	Gas	1953	Ellenburger	15,000
Texas Gulf Coast	Phillips 1 O'Daniel Unit, Alta Loma pool; Galveston	Cond.	1957	Frio	14,747
Southwest Texas	Amerada 1 Lowe Craig, Lowe Ranch; McMullen	Gas	1956	Edwards	14,479
North Dakota	Amerada 1 Peterson-Davidson, Beaver Lodge; Williams	Cond.	1958	Ordovician	13,214
Montana	Sun-Phillips 2 Dynneson, 30-24n-58e; Richland	Oil	1955	Ordovician	12,654
East Texas	Tidewater 1 Ramey Unit, New Hope field; Franklin	Cond.	1954	Smackover	12,341
Canada	British-American 48-4 Berland River; Alberta	Gas	1958	D-3	12,179
Florida	Humble 1 Gulf Coast, Sunniland field; Collier (now abd.)	Oil	1943	Glen Rose	11,626
Alabama	Zach Brooks 1 Donovan, 25-2n-3w, Citronelle; Mobile	Oil	1955	Rodessa	11,414
Texas Panhandle	Phillips 1 Troy "A," M-2, Sec. 86, H&GN; Gray	Oil	1955	Ellenburger	11,370
North Louisiana	Carter 1 Taylor-Duke Unit, Red Rock field; Webster	Oil	1957	Smackover	11,300
Alaska	Richfield 1 Swanson River; Kenai	Oil	1957	Tertiary	11,215
Utah	Carter 1 Peterson, 13-1s-1w (USM); Uintah	Oil	1952	Wasatch	10,244
North Texas	Frank Weiner 1 Hazlip, Mineral Creek; Grayson	Cond.	1952	Mulder	10,160
Colorado	Malco Refineries 1 Kowach, 25-6n-90w; Moffat	Oil	1957	Weber	10,084
W. New Mexico	Southern Union 9 Barker Creek, 21-32n-14w; San Juan	Gas	1945	Pennsylvania	9,468
Arkansas	Atlantic 1 McKamie-Patton C-216; Lafayette	Oil	1952	Smackover	9,453
South Dakota	Shell 1 State "A," 9-21n-4e; Harding	Oil	1953	Red River	8,690
West Virginia	Ohio 1 Kuykendall et al., Dry Fork dist.; Tucker	Gas	1946	Oriskany	8,410
Pennsylvania	Felmont 1 Rhodes, Jenners Twp.; Somerset	Gas	1958	Oriskany	8,420
Michigan	Michigan Gulf 1 Bateson, Kawkawlin field; Bay (now abd.)	Oil	1946	Salina	7,850
Nebraska	Gulf 1 Sisson, 18-21n-58w; Kimball	Oil	1951	Dakota	7,431
Nevada	Shell 1 Unit, 27-8n-57e; Nye	Oil	1954	Volcanics	6,730
Kansas	Stanolind 1 Wall, 35-32s-23w; Clark	Oil	1951	Viola	6,576
Ohio	East Ohio 1 Phillips, Sec. 23, Washington Twp.; Harrison	Gas	1951	Silurian	5,899
New York	Kane 1 Lewis, West Union Twp.; Steuben	Gas	1942	Oriskany	5,228
Kentucky	United Carbon 1 Howe; Pike	Gas	1932	Devonian	5,170
Arizona	Humble 1 Navajo, 4-41n-28e; Apache	Oil	1955	Pennsylvanian	4,816
Illinois	Kingwood 24-A Shanafelt, 20-2n-2e; Marion	Oil	1943	Trenton	4,657
Maryland	Cumberland-Allegheny S-424 Beachy, Ryans Glade 8 dist; Garrett	Gas	1949	Oriskany	4,456
Tennessee	Nelson 1 Boos; Anderson	Gas	1955	.....	3,404
Indiana	Lewis 1 Hill, 35-3s-14w; Posey	Oil	1939	McClosky	3,144

. . . These wells hold drilling-depth records

State or area—	Well and location; county—	Result	Year comp.	Deepest formation	Total depth
West Texas	Phillips 1-EE University; Pecos	...	....	Ellenburger	25,340
Oklahoma	Shell 5 Rumberger, Elk City field; Beckham	...	....	Chester	24,002
South Louisiana	Richardson & Bass 1 LLE-Humble "L," 35-19s-27e; Plaquemines	Oil	1956	Miocene	22,570
California	Ohio 72-4 K.C.L.-A, Paloma field; Kern	Dry	1954	Miocene	21,482
Wyoming	Superior 1 Unit, 27-27n-103w; Sublette	Dry	1949	Dakota	20,521
Mississippi	Vasen 1 Fee, 9-2s-11w; Stone	Idle	....	.....	20,450
Texas (Dist. 4)	Ginther et al. 1-A Killam; Webb	Dry	1958	L. Cretaceous	19,503
Texas (Dist. 2)	Magnolia A-417 West Ranch; Jackson	Oil	1955	Jackson	19,062
Texas (Dist. 3)	Humble 1 Robertson-McDonald, Moss Bluff dome; Liberty	Dry	1957	Vicksburg	18,074
E. New Mexico	Shell 1 James Ranch, 36-22s-30e; Eddy	Dist.	1958	Ellenburger	17,555
Texas (Dist. 1)	Humble 1 Mills Mineral Trust; Val Verde	Dry	1957	Ellenburger	17,525
Colorado	Phillips 1 Manuel, 27-1n-95w; Rio Blanco	Gas	1957	Weber	17,033
Texas, East	Humble 1 McWatters; Freestone	Oil	1949	Smackover	16,347
Texas Panhandle	Max Pray 1 Mills, 37-A-7-H&GN; Wheeler	Dry	1958	.....	16,156
Alabama	Humble 1 Williams, 10-3n-2e; Clark	Oil	1952	Jurassic	15,729
Canada	Texaco 8-28 Simonette River	...	....	.....	15,283
Florida	Gulf 1 State; Monroe	Dry	1947	.....	15,155
North Louisiana	CVOC-Oliphant 2 Banks, Cotton Valley field; Webster	Dry	1947	Salt	14,967
North Dakota	Amerada 9-A Unit, Beaver Lodge; Williams	T. abd.	1957	.....	14,828
Texas, North	Humble 1 Williams, D. Yglesias Sur. A-1393; Grayson	Dry	1953	.....	14,363
Montana	Mountain States-Phillips 1 NP, 33-9s-21e; Carbon	Dry	1956	Chugwater	13,830
Alaska	Cal-Standard 1 Deep Creek	Dry	1958	.....	14,221
Utah	Equity & Pacific Western 1 Unit, 33-21s-21e; Grand	Dry	1949	Pennsylvanian	13,767
W. New Mexico	Magnolia 1 Jicarilla "A," 18-23n-2w; Rio Arriba	Gas	1955	.....	13,590
West Virginia	Hope 9634; Wood	Dry	1955	.....	13,331
Arkansas	Hunt 1 McDonald, 1-20s-21w; Columbia	Dry	1957	Salt	12,925
Oregon	Sinclair 1 Federal-Mapleton, 12-16s-10w; Lane	Dry	1955	.....	12,880
Idaho	Phillips-Utah Southern 1 Juniper, 10-14s-30e; Oneida	Dry	1952	.....	12,844
New York	New York Natural, Woodhull Twp.; Steuben	Active	....	.....	12,415
Pennsylvania	The California Co. 1 Bennett; Sullivan	Dry	1951	Siluro-Ord.	12,343
Nevada	Continental-Standard of Calif. 1 Unit, 32-20n-60e; White Pine	Dry	1952	.....	11,543
Kentucky	United Fuel 1 Williams; Breathitt	Active	1958	Granite	11,130
Michigan	Ohio-Pure 1 Reinhardt, 35-22n-2e; Ogemaw	Dry	1948	Cambro-Ord.	11,012
Washington	Standard of Calif. 1 Alderwood; Snohomish	Dry	1947	Mid-Eocene	11,002
North Carolina	Standard (Jersey) 1 Hatteras Light; Dare	Dry	1946	Granite	10,054
Virginia	California 1 Kipps; Montgomery	Dry	1949	Ordovician	9,936
South Dakota	Shell 1 Homme, 13-20n-12e; Perkins	Dry	1951	Granite	9,348
Nebraska	Shell 2 Schneider "L," Heidemann field; Kimball	Oil	1957	Granite	8,875
Kansas	Stanolind 1 Feathers, 15-35s-33w; Seward	Gas	1947	"Crystalline"	8,243
Maryland	Snee 1 Schartzer; Garrett	Dry	1941	Helderberg	8,165
Ohio	Ohio 1-C Knowlton, Sec. 10, Independence Twp.; Washington	Dry	1933	Clinton	7,889

★ DRILLING

Cable-tool wells show gains, due to big Kentucky play

A SURVEY of 1958 drilling operations throughout the United States revealed that about 17.5% of all wells drilled were put down with cable tools. This is a healthy increase over 1957 when only 13.5% of all wells were drilled with cable tools. The big gain is mostly due to one factor . . . the big shallow play in Green County, Kentucky, where more than 700 wells went down in 1958.

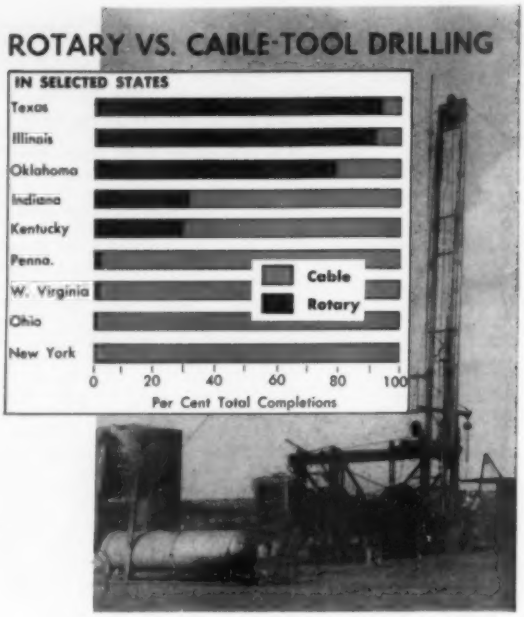
The 1958 percentage figures are based on an estimated 8,617 cable-tool completions versus 40,494 rotary-tool completions. Total well completions in the country fell from 53,838 to 49,111.

. . . The East. As usual, the biggest number of cable-tool completions were in the eastern states of Ohio, Kentucky, West Virginia, New York, and Pennsylvania.

New York State drilling is almost entirely cable-tool, while Pennsylvania has a 97.2% cable-tool completion rate. Kentucky, boosted by the big play at Greensburg, is 70.5% cable-tool. West Virginia has a 97.4% tally of cable-tool well completions. Ohio's count in 98.6%.

State-by-state completions

	Cable	Rotary	Total comp.
Arizona	6	13	19
California	16	1,460	1,476
Georgia	1	0	1
Illinois	206	2,213	2,419
Indiana	601	276	877
Kansas	101	3,921	4,022
Kentucky	1,507	630	2,137
Michigan	269	167	436
Mississippi	1	397	398
Missouri	6	0	6
Montana	40	298	338
Nevada	1	0	1
New Mexico	411	1,499	1,910
New York	544	0	544
Ohio	1,034	15	1,049
Oklahoma	1,358	4,996	6,354
Pennsylvania	634	18	652
South Carolina	1	0	1
South Dakota	4	11	15
Tennessee	24	0	24
Texas	1,059	17,006	18,065
Virginia	4	0	4
West Virginia	736	20	756
Wyoming	53	709	762
Others	0	6,845	6,845
Total, 1958	8,617	40,494	49,111
Total, 1957	7,289	46,549	53,838



. . . Middle West. Illinois and Indiana still see cable-tool drilling, especially in southwestern Indiana counties. The Indiana count is 68.5% compared to Illinois' rather low figure of 8.5%.

. . . Mid-Continent. Oklahoma still uses quite a few cable tools. There were 1,358 wells completed with cable tools last year, or 21.4% of total drilling in the state. Most of Oklahoma's cable-tool work remains in the northeastern counties.

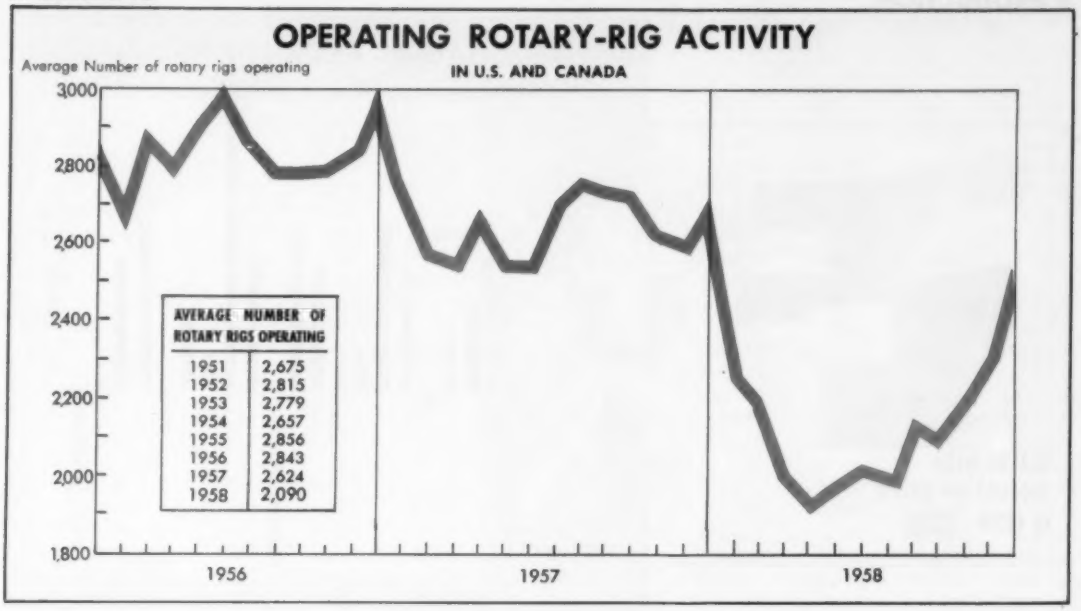
Kansas drilled 4,022 wells with 101 of them being drilled with cable tools. All of Missouri's six wells were drilled with cable tools. Texas completions fell to 18,065 (total) during 1958. Cable-tool work in this state amounted to only 5.9%. Most cable-tool drilling in Texas is done in the western counties and in the northern areas.

. . . Rockies. Cable-tool completions in the Rocky Mountain states are as follows: Montana with 40, South Dakota with 4, and Wyoming with 53. This is a considerable drop from the previous year when there were 89 cable-tool wells in Montana, 121 in Wyoming, and 1 in Utah. New Mexico cable-tool work is divided between the Permian basin area and the San Juan basin. There were 1,910 wells completed in the state in 1958, of which 411 were with cable tools. Most of these wells were in the southeastern counties of Lea and Eddy.

A Forecast

Definite increases in cable-tool drilling can be seen on the near horizon. With shallow plays beginning to return to the scene the percentage of cable-tool drilling will very likely continue to increase slightly each year.

States with increases of note in 1958, mainly Oklahoma and Kentucky, will see even more shallow drilling in the coming year. The Green County play in Kentucky is far from over. All indications are that more of these plays will pop up in the eastern states.



Rotaries drill more wells per rig

ALTHOUGH fewer rotary rigs were used during 1958 than at any time in the last 10 years, those in operation drilled more wells per rig.

Over the year, the number of active rotary rigs in the United States and Canada averaged 2,090. They drilled more than 42,900 of the more than 51,500 wells completed in both countries during the year, or an average of 20.52 wells per rig.

This compares with an average of 18.67 wells per rig (2,624 rigs) in the preceding year, 18.24 wells in 1956, and 17.96 wells in 1955.

Rotary drilling during the year reached its lowest level late in April when only 1,870 rigs were active as reported in Hughes Tool Co.'s weekly survey. This was the fewest number of rigs in operation at any time since before 1949.

The greatest number of rigs running at any one time during the year was 2,565, or 277 below the 1957 peak and 773 under the all-time record of 3,338 rigs reported running the latter part of 1955.

Rotary-rig activity by years

(United States and Canada)

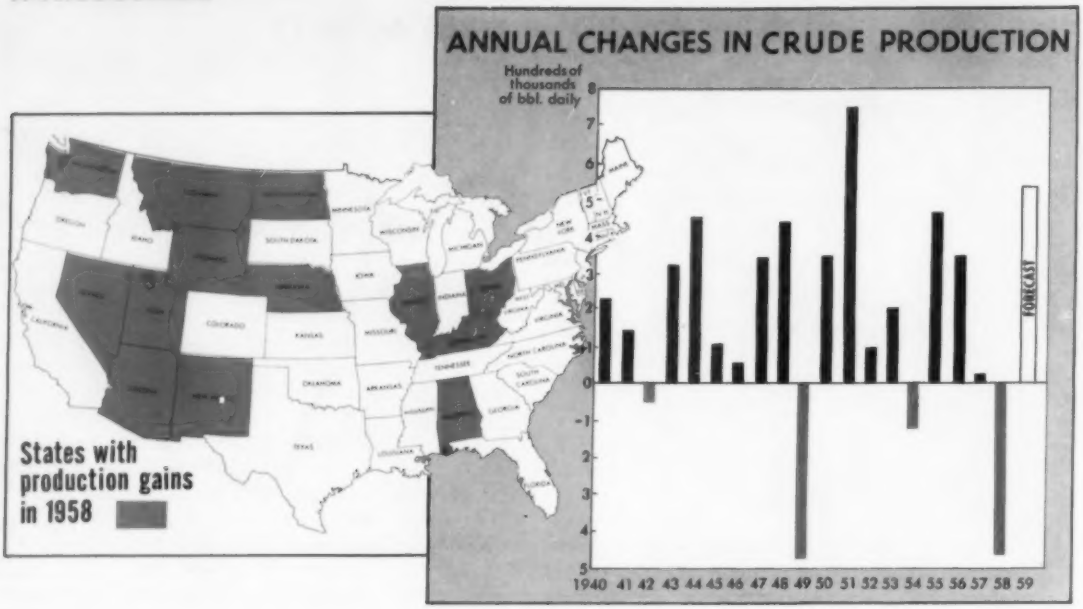
Year	No. rigs Jan. 1	No. rigs Dec. 31	Peak No.	Low No.
1958	2,373	2,364	2,565	1,870
1957	2,617	2,518	2,842	2,355
1956	3,023	2,759	3,132	2,619
1955	2,683	3,084	†3,338	2,574
1954	2,735	2,830	2,963	2,439
1953	2,775	2,795	3,079	2,580
1952	2,973	2,801	3,032	2,470
1951	2,406	3,066	3,181	2,119

*Based on Hughes Tool Co. weekly average figures. †All-time record number.

Rotary-rig activity by states

State—	No. rigs Jan. 1	No. rigs Dec. 31	Avg. No.	Peak No.	Low No.
Alabama	8	10	7	14	4
Arkansas	18	24	20	29	11
California	91	85	80	98	65
Colorado	33	38	36	58	22
Ill.-Ind.-Ky.	55	64	59	83	17
Kansas	118	151	130	180	68
Louisiana	374	325	309	374	270
North	35	36	35	44	21
South (onshore)	261	251	228	261	193
Offshore	78	38	47	78	32
Michigan	7	9	9	14	5
Mississippi	54	65	44	70	28
Montana	29	19	23	29	15
Nebraska	21	20	22	30	12
New Mexico	129	97	109	131	84
North Dakota	43	32	33	43	27
Oklahoma	220	234	204	272	132
Pennsylvania-Eastern†	11	14	17	20	11
Texas	865	866	719	953	608
South (onshore)	191	186	151	225	121
Offshore	3	1	2	5	0
North and East	336	189	233	336	155
West and West Cent.	335	490	334	524	250
Utah	50	34	37	50	22
Wyoming	50	78	58	86	38
Others	6	6	7	12	4
Total U. S.	2,182	2,171	1,923	‡2,356	‡1,694
Canada	191	193	167	241	76
Total	2,373	2,364	2,090	‡2,565	‡1,870

*Based on Hughes Tool Co. weekly figures. †Includes New York, Ohio, and West Virginia. ‡From U. S. and Canada weekly totals.



"Outlook: record production in 1959"

...following painful adjustments in 1958

THE YEAR 1958 was a period of adjustments, and production of domestic crude bore the brunt of the changes. The cut in crude output averaged 464,000 bbl. daily or a total reduction for the year of about 169,000,000 bbl.

With crude prices averaging about $3.00 a barrel, the cutback lowered producers' income for the year by half a billion dollars.

Here are some of the factors that influenced the decrease in production.

... **Total demand** was down in 1958. The big reason for the drop was the decrease in exports. Total demand for 1957 was high because of abnormal exports during the first quarter of the year when the Suez Canal was closed. A return to normal exports in 1958 would have meant a reduction, but even the normal trend for exports has been downward for the past few years. The combination of the two forces produced a reduction in exports of slightly more than 50% in 1958.

... **Domestic demand** did not show its normal increase for the year. The dip in the general economy tended to lower consumption of industrial fuels. Increased supplies of natural gas tended to hold down the gains in sales of home-heating oils. Even gasoline sales felt the influence of the general downward trend. New-car sales were off, and gasoline consumption by trucks followed the trend of general industrial activity. Gasoline consumption gained only 1.86% for the year.

... **Inventories** were very high at the end of 1957 and had to be reduced. Every barrel that was taken out of storage cut a barrel off required new supply.

Total stocks of all oils gained 60,900,000 bbl. in 1957 on top of an increase of 65,500,000 bbl. in 1956. This backlog became so burdensome that something had to be done. The solution called for a reduction in new supply. New supply includes crude production, output from natural-gasoline and cycling plants, and imports.

... **Imports** increased in 1958. The Government's program for voluntary limitation of crude imports was not a complete success, but it did lower crude imports by about 76,000 bbl. daily. However, this reduction was more than offset by gains in product imports. Total product imports increased 155,000 bbl. daily for a net gain in the import total of 79,000 bbl. daily.

... **Production of gas liquids** decreased 1.5% for the year but the volume cut was too small to make a dent in oversupply.

... **The big reduction** was made in production of domestic crude. There were 14 important producing states with lower production in 1958 than in 1957. Eleven states reported increases. Texas with 41% of production in 1957 accounted for 64% of gross reductions in 1958.

... **The outlook** is for record production in 1959.

U. S. production of crude oil and lease condensate

(Thousands of barrels)

	1958 prod. change	1958	1957	1956	1955	1954	1953	1952	Cum. prod.
Alabama	525	5,931	5,406	3,069	1,411	1,584	1,694	1,279	24,023
Arkansas	— 2,161	28,886	31,047	29,355	28,369	29,130	29,681	29,440	1,031,945
California	— 25,084	314,036	339,646	350,754	354,812	355,865	365,085	359,450	11,414,258
Colorado	— 6,447	48,535	54,982	58,516	52,653	46,206	36,402	30,381	500,857
Florida	— 13	448	461	479	495	548	543	591	5,736
Illinois	4,998	82,081	77,083	82,346	81,423	66,798	59,026	60,089	2,075,592
Indiana	— 909	11,753	12,662	11,513	10,988	11,204	12,823	12,037	294,904
Kansas	— 2,975	120,639	123,614	124,204	121,669	119,317	114,566	114,807	3,076,876
Kentucky	526	17,555	17,029	17,628	15,518	13,791	11,518	11,918	368,604
Louisiana	— 17,891	312,005	329,896	299,421	271,010	246,558	256,632	243,929	4,749,971
Michigan	— 942	9,227	10,169	10,740	11,266	12,028	12,285	13,251	415,141
Mississippi	— 315	38,607	38,922	40,824	37,741	34,240	35,620	36,310	582 901
Montana	1,098	28,270	27,172	21,760	15,654	14,195	11,920	9,606	305,745
Nebraska	925	20,511	19,586	16,204	11,203	7,783	6,344	2,660	92,884
Nevada	6	50	44	64	64	33	.....	.....	255
New Mexico	3,917	98,676	94,759	87,893	82,958	74,820	70,441	58,681	1,302,782
New York	— 898	1,779	2,677	2,748	2,904	3,257	3,800	4,242	192,262
North Dakota	448	13,707	13,259	13,495	11,143	6,025	5,183	1,549	64,386
Ohio	783	6,261	5,478	4,785	4,353	3,880	3,610	3,350	655,820
Oklahoma	— 14,708	199,953	214,661	215,862	202,817	185,851	202,570	190,435	7,837,187
Pennsylvania	— 1,429	6,750	8,179	8,230	8,531	9,107	10,649	11,233	1,209,489
Texas	—133,937	939,930	1,073,867	1,107,808	1,053,297	974,275	1,019,164	1,022,139	21,929.032
Utah	19,895	24,262	4,367	2,466	2,227	1,905	1,807	1,737	41,788
West Virginia	— 33	2,182	2,215	2,179	2,320	2,902	3,038	2,602	461,155
Wyoming	5,809	115,393	109,584	104,830	99,483	93,533	82,618	68,074	1,659,232
Other States	— 15	121	136	110	119	153	63	46	2,659
Total U. S.	—168,827	2,447,548	2,616,901	2,617,283	2,484,428	2,314,988	2,357,082	2,289,836	60,295,484
Daily average	— 464	6,706	7,170	7,151	6,807	6,342	6,458	6,256	

Production per well by states

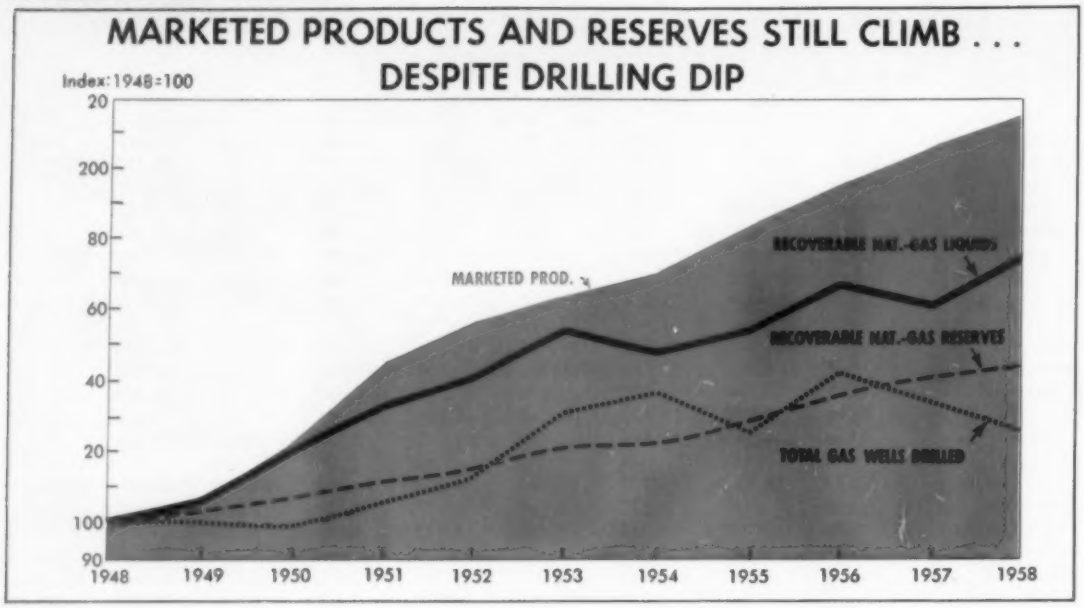
	Bbl. daily 1958	Producing wells	Daily avg. per wells
Alabama	16,249	260	62.5
Arkansas	79,140	5,725	13.8
California	860,373	37,638	22.9
Colorado	132,973	2,205	60.3
Florida	1,227	11	111.5
Illinois	224,879	38,390	5.9
Indiana	32,200	5,223	6.2
Kansas	330,518	39,200	8.4
Kentucky	48,096	18,540	2.6
Louisiana	854,808	24,975	34.2
Michigan	25,279	4,250	5.9
Mississippi	105,773	2,510	42.1
Montana	77,452	3,790	20.4
Nebraska	56,195	1,325	42.4
Nevada	137	3	45.7
New Mexico	270,345	11,435	23.6
New York	4,874	17,356	0.3
North Dakota	37,553	1,155	32.5
Ohio	17,153	15,420	1.1
Oklahoma	547,817	79,425	6.9
Pennsylvania	18,493	56,246	0.3
Texas	2,575,151	186,750	13.8
Utah	66,471	525	126.6
West Virginia	5,978	14,415	0.4
Wyoming	316,145	7,025	45.0
Other states	332	120	2.8
Total U. S.	6,705,611	573,917	11.7

Producing records by states

(Barrels daily)

	Record year	Production in record year
Alabama	1958	16,249
Arkansas	1925	212,049
California	1953	1,000,233
Colorado	1956	159,880
Florida	1951	1,633
Illinois	1940	403,407
Indiana	1953	35,132
Kansas	1956	339,355
Kentucky	1956	48,164
Louisiana	1957	903,825
Michigan	1939	64,279
Mississippi	1948	125,030
Montana	1958	77,452
Nebraska	1958	56,195
Nevada	1956	175
New Mexico	1958	270,345
New York	1882	18,315
North Dakota	1958	37,553
Ohio	1896	65,592
Oklahoma	1927	761,027
Pennsylvania	1891	86,093
Texas	1956	3,026,798
Utah	1958	66,471
Virginia	1947	167
West Virginia	1900	44,373
Wyoming	1958	316,145
United States	1957	7,169,592

★ PRODUCTION-RESERVES



Gassers drop for second straight year

NEW RECORDS were set last year by the natural-gas industry. This is a notable achievement in view of the fact that gas completions continued to fall for the second straight year. Marketed production of natural gas was up 3%, natural-gas reserves increased 2.3%, natural-gas liquids reserves rose 8.3%. Total number of gas completions dropped 238 wells, off 6.1% over the previous year's total.

A dozen states still continued to produce the lion's share of total natural gas to the tune of 95.76%. Of the 12 major gas-producing states, only 3 registered gains in number of gas completions. These were Oklahoma, 106; West Virginia, 46; and Wyoming with 20 wells more than in 1957. The largest decline occurred in Louisiana with 166 fewer wells than the preceding year.

Although the gas reserves increased 5.6 trillion cubic feet, the new reserves only account for 6.1 months' supply at present consumption rates. In 1958 an average of 917 billion cubic feet was used per month. Pending the unforeseen, 1959 should be a banner year. Marketed production, reserves—

Marketed production of natural gas

(Millions of cubic feet)

	1958	Per cent change over 1957	1957	Per cent change over 1956	1956	Per cent change over 1955	1955	Cumulative 1906-58	Cum. per cent of U. S.
Texas	5,148,200	— 0.1	5,156,215	3.1	4,999,889	5.7	4,730,798	64,930,311	40.97
Louisiana	2,318,800	11.5	2,078,901	10.2	1,886,302	12.3	1,680,032	23,355,575	14.74
New Mexico	741,000	2.5	723,004	15.4	626,340	15.8	540,664	5,804,213	3.66
Oklahoma	763,000	6.0	719,794	6.1	678,603	10.3	614,976	14,498,496	9.15
Kansas	606,200	3.3	586,690	11.5	526,091	11.7	471,041	7,370,604	4.65
California	480,600	— 2.4	492,338	— 2.4	504,458	— 6.3	538,178	14,480,086	9.14
West Virginia	207,100	2.3	202,440	— 1.1	204,717	— 3.6	212,403	9,815,647	6.20
Mississippi	166,900	— 1.8	169,967	— 8.2	185,137	13.5	163,167	1,717,193	1.08
Pennsylvania	110,200	8.3	101,801	— 2.6	104,508	5.3	99,172	5,526,043	3.49
Wyoming	113,000	— 3.6	117,256	38.9	84,398	8.5	77,819	1,790,835	1.13
Colorado	97,000	1.8	95,259	75.7	54,205	10.3	49,152	524,910	0.33
Kentucky	69,000	— 1.5	70,024	— 5.0	73,687	0.6	73,214	1,933,215	1.22
Subtotal	10,821,000	2.9	10,513,689	5.9	9,928,335	7.3	9,250,616	151,747,128	95.76
Other states	182,000	9.3	166,569	8.5	153,588	— 0.7	154,735	6,717,633	4.24
Total U. S.	11,003,000	3.0	10,680,258	5.9	10,081,923	7.2	9,405,351	158,464,761	100.00

Gas completions are down, but . . . reserves are up

State—	1957 Field wells	1957 Successful wildcats	1958 Field wells	1958 Successful wildcats	Change in total wells	(Billion cubic feet at 60° F. and 14.65 psia.) Jan. 1, 1958*	Jan. 1, 1959	Change
Arkansas	14	7	26	11	16	1,283	1,330	47
California	44	9	29	10	− 14	8,953	8,800	− 153
Colorado	73	18	60	20	− 11	2,381	2,180	− 201
Illinois	18	1	43	6	30	166	135	− 31
Indiana	14	0	11	5	2	31	29	− 2
Kansas	303	30	205	23	−105	19,296	20,100	804
Kentucky	157	7	135	4	− 25	1,225	1,203	− 22
Louisiana	306	74	196	18	−166	51,436	55,500	4,064
Michigan	46	1	19	8	− 20	444	484	40
Mississippi	3	0	1	1	− 1	2,298	2,155	− 143
Montana	13	2	1	5	− 9	670	645	− 25
Nebraska	1	1	0	0	− 2	189	180	− 9
New Mexico	596	10	482	9	−115	22,258	20,500	−1,758
New York	2	3	8	7	10	93	100	7
North Dakota	0	1	0	0	− 1	743	835	92
Ohio	198	3	242	7	48	902	930	28
Oklahoma	203	31	300	40	106	14,260	14,800	540
Pennsylvania	289	3	272	9	− 11	854	895	41
Texas	752	129	800	55	− 26	113,085	115,000	1,915
Utah	5	7	13	4	5	859	1,020	161
Virginia	11	0	4	0	− 7	38	39	1
West Virginia	449	17	499	13	46	1,561	1,559	− 2
Wyoming	36	10	54	12	20	3,457	3,650	193
Miscellaneous	4	11	1	6	− 8	87	101	14
Total United States	3,537	375	3,401	273	−238	246,569	252,170	5,601

*American Gas Association figures as of Jan. 1, 1958.

both natural-gas and associated liquids—should continue to rise. The outlook for gas completions is enheartened by two key factors—the reversal of the Memphis decision and a brighter economy may help erase the effects of recent recessional trends. New markets and increased supply facilities will continue to make natural gas more readily available as a reasonable, clean, instant-heat fuel.

. . . **Mid-Continent** gas exploration was centered in the northwestern Anadarko basin once again. This huge area is fast becoming one of the nation's biggest sources of new gas supplies. In addition to the already prolific Panhandle gas fields of both Oklahoma and Texas, new reservoirs are being tapped in Ellis, Harper, Woodward, and other northwestern Oklahoma counties. A revival of the old Erick gas area in Beckham County, western Oklahoma, also netted new gas reserves. The Arkansas River Valley of Arkansas added new gas production in 1958 with promise of even more in 1959.

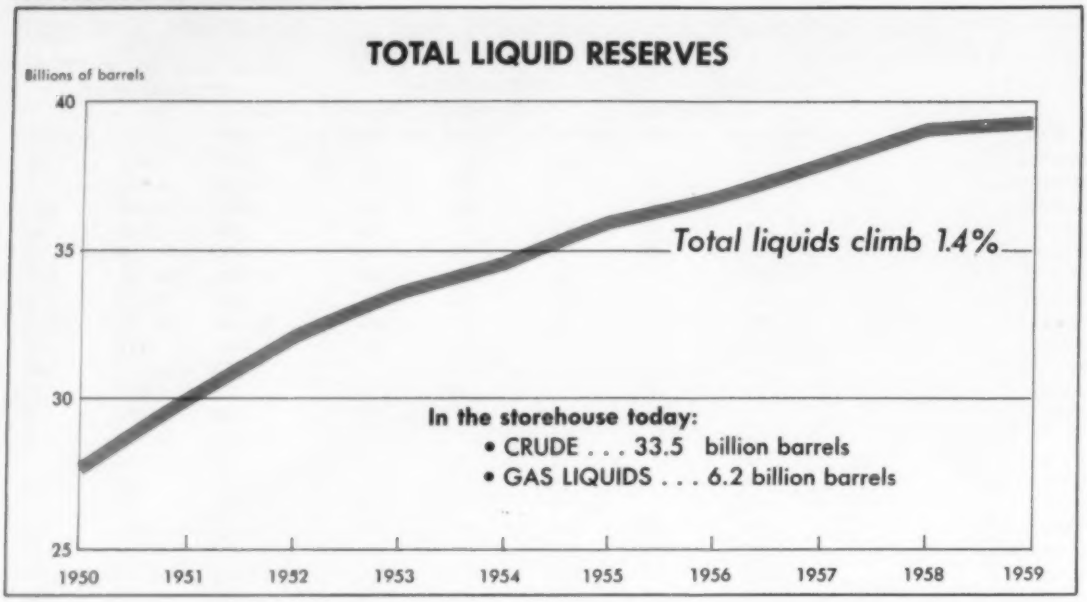
. . . **Gulf Coast.** Jefferson, Chambers, Hidalgo, Zapata, and other Rio Grande embayment counties led Texas Gulf Coast and South Texas gas exploration. Huge gas and gas-condensate reserves were opened in Southeast Texas, particularly in Jefferson and Chambers counties. Brown-Bassett field in Terrell County, far Southwest Texas discovery, looms as a major gas find. Ellenburger, Silurian, and Wolfcamp wells in this deep field in remote wildcatting country may become another Puckett. In South Louisiana most of the discoveries were gas and gas-condensate in 1958.

. . . **San Juan basin.** Gas reserves here grew perhaps more heavily in 1958 than in any year in the past half-dozen. In addition to the already active areas, new success was reported in deeper Dakota rocks throughout San Juan and Rio Arriba counties in northwestern New Mexico. A rather extensive gas trend built up between Blanco and Bisti. This new field, called Gallegos, grew extensively in 1958 and will grow even more in 1959. Look for a push into Dakota rocks for gas this year.

. . . **Rockies.** The big gas story of the year in this area was in the Green River basin's east end at Desert Springs. This Cretaceous field is the major gas discovery of the year for the Rockies. Several wells found prolific production in Lewis and Mesaverde sands. The field is still growing. The Big Piney and LaBarge areas in the west part of the Green River basin added impressive list of new gas wells as the basin comes into its own as the gas province of the Rockies.

. . . **Appalachian.** These gas reserves were added to heavily in 1958 with brisk wildcatting and development programs in West Virginia, Ohio, Pennsylvania, and New York. Ohio gas completions were up over previous years. Gas exploration in Pennsylvania was to the deeper Oriskany zones. This oldest of the nation's oil and gas provinces looms as a future major source of new gas, particularly in Pennsylvania, Ohio, and offshore in Lake Erie.

★ PRODUCTION-RESERVES



Liquid reserves 39.71 billion barrels

IT WAS A POOR YEAR for new oil discovery in the United States. Estimates of new reserves uncovered in 1958 barely top the total oil produced during the year. And if domestic demand had lived up to expectations, a net loss in reserves would probably have occurred.

The gross addition to reserves of crude oil and natural-gas liquids amounted to 3,302 million barrels; of this, 2,471 million was crude and 831 million natural-gas liquids. Deducting total production of 2,740 million barrels, the net gain stands at 562 million barrels for the year. A further breakdown reveals that 88½ million of this was crude, and 473½ million natural-gas liquids.

As of January 1, 1959, then, the proved United States reserves of total hydrocarbon liquids are estimated to be 39,714 million barrels. Of this, 33,553 million is crude oil and 6,161 million is natural-gas liquids.

1958 Was a "Gas Year"

There was a notable increase over 1957 in discovery of new natural-gas liquids reserves. This is a reflection of the growing emphasis on the search for gas throughout the land. And 1958 can well be described as a "gas year." Louisiana retained its lead as the chief contributor of new gas reserves, as well as new oil. Other large gas suppliers were Texas, Kansas, Oklahoma, and Wyoming. Oklahoma, New Mexico, and North Dakota accounted for substantial oil gains.

United States operators completed 9,588 wildcat wells in 1958, and 1,351 of them opened new fields, oil or gas. This adds up to a total success ratio of 14.1%, a slight drop from the 14.2% of 1957. Wildcatting operations were down 17.4% from 1957.

As usual, revisions and extensions of older fields were responsible for most of the gain in gross reserves,

Liquid-hydrocarbons reserves

(Millions of barrels)

State	Jan. 1, 1959	Jan. 1, 1958	Change
Arkansas	395.8	403.1	–7.3
California	4,353.0	4,417.7	–64.7
Colorado	364.8	395.0	–30.2
Illinois	715.0	744.8	–29.8
Kansas	1,249.0	1,237.2	11.8
Kentucky	180.3	161.7	18.6
Louisiana	6,276.0	5,861.2	414.8
Michigan	91.4	76.2	15.2
Mississippi	464.2	470.4	–6.2
Montana	439.0	427.8	11.2
New Mexico	1,219.0	1,208.5	10.5
North Dakota	371.5	333.7	37.8
Oklahoma	2,583.0	2,483.6	99.4
Pennsylvania	123.9	128.5	–4.6
Texas	18,504.0	18,398.6	105.4
Utah	387.1	347.1	40.0
West Virginia	70.5	74.9	–4.4
Wyoming	1,551.5	1,614.2	–62.7
Others*	374.8	367.6	7.2
Total United States	**39,713.8**	**39,151.8**	**562.0**

*Alabama, Alaska, Arizona, Florida, Indiana, Maryland, Missouri, Nebraska, Nevada, New York, Ohio, South Dakota, Tennessee, Virginia, and Washington.

Estimated proved recoverable crude-oil reserves

(Thousands of barrels—primary recovery)

State—	Proved reserves, 1-1-58	1958 Discoveries	1958 Extensions and revisions	1958 Production	Proved reserves As of 1-1-59	Proved reserves Year's change	Proved reserves Per cent of U. S.
Alabama	*36,000	150	3,911	5,911	34,150	−1,850	0.10
Arkansas	366,000	1,800	21,840	28,840	360,800	−5,200	1.08
California total	4,112,000	17,000	240,036	314,036	4,055,000	−57,000	12.09
Coastal	902,000	6,500	94,280	80,780	922,000	20,000	2.75
Los Angeles	1,163,000	1,500	58,437	99,937	1,123,000	−40,000	3.35
San Joaquin	2,047,000	9,000	87,319	133,319	2,010,000	−37,000	5.99
Colorado	384,000	8,000	11,535	48,535	355,000	−29,000	1.06
Illinois	733,000	8,000	48,081	82,081	707,000	−26,000	2.11
Indiana	69,000	6,000	10,753	11,753	74,000	5,000	0.22
Kansas	1,048,000	28,000	83,639	120,639	1,039,000	−9,000	3.10
Kentucky	156,000	13,000	24,555	17,555	176,000	20,000	0.52
Louisiana total	4,842,000	45,000	630,887	279,887	5,238,000	396,000	15.61
North	794,000	4,000	30,627	39,627	789,000	−5,000	2.35
South	2,757,000	33,000	364,707	198,707	2,956,000	199,000	8.81
Offshore	1,291,000	8,000	235,553	41,553	1,493,000	202,000	4.45
Michigan	75,000	2,000	22,227	9,227	90,000	15,000	0.27
Mississippi	416,000	10,000	23,743	37,743	412,000	−4,000	1.23
Montana	420,000	5,000	35,270	28,270	432,000	12,000	1.29
Nebraska	126,000	10,000	17,511	20,511	133,000	7,000	0.39
New Mexico	888,000	19,000	125,042	96,042	936,000	48,000	2.79
New York	61,500	0	0	1,779	59,721	−1,779	0.18
North Dakota	311,000	16,000	33,707	13,707	347,000	36,000	1.03
Ohio	*59,000	300	4,761	6,261	57,800	−1,200	0.17
Oklahoma	2,141,000	51,000	235,953	199,953	2,228,000	87,000	6.64
Pennsylvania	125,000	300	1,450	6,750	120,000	−5,000	0.36
Texas total	15,127,000	89,000	448,623	910,623	14,754,000	−373,000	43.97
East	2,680,000	5,000	30,013	103,013	2,612,000	−68,000	7.78
Gulf Coast	3,194,000	16,000	67,071	165,071	3,112,000	−82,000	9.27
North	1,152,000	22,000	74,472	121,472	1,127,000	−25,000	3.36
Panhandle	534,000	10,000	49,277	38,277	555,000	21,000	1.65
Southwest	1,363,000	12,000	34,358	83,358	1,326,000	−37,000	3.95
West	6,204,000	24,000	193,432	399,432	6,022,000	−182,000	17.96
Utah	347,000	2,000	62,262	24,262	387,000	40,000	1.15
West Virginia	52,000	0	1,182	2,182	51,000	−1,000	0.15
Wyoming	1,563,000	6,000	45,393	115,393	1,499,000	−64,000	4.47
Others†	7,000	700	364	564	7,500	500	0.02
Total United States	**33,464,500**	**338,250**	**2,132,725**	**2,382,504**	**33,552,971**	**88,471**	**100.00**

*Adjusted. †Alaska, Arizona, Florida, Maryland, Missouri, Nevada, South Dakota, Tennessee, Virginia, and Washington.

2,877 million barrels falling into this category, while only 425 million came from new-field discoveries. Louisiana nosed out all other states in new "revision and extension" oil, followed by Texas, California, Oklahoma, and New Mexico in that order. As for new-field reserves, Texas led the field; Oklahoma was second, and Louisiana third. In over-all net gain, a figure determined, of course, by production, Louisiana took the honors, followed by Oklahoma, New Mexico, and Utah.

Wildcat drilling was down all over the country. Texas as usual led all other states, with 3,636 tries, a fall from 5,004 in 1957. This was quite a blow, but worse still was a dry-hole percentage of 87.1. Oklahoma had the lowest percentage of failures with 78.8%, while Illinois had the highest with 93.1%.

These serious setbacks naturally are reflected in the added reserves picture. It's still the same old story: "The more you drill, the more you find." The wildcat success ratio has not dropped alarmingly over-all, but present data point to not one major oil strike in the United States last year. The cumulative effect of many small discoveries continues to offset domestic production to keep the reserve figure up, but if even this is to continue, it will demand ever greater numbers of wildcat wells.

In the Offshore Louisiana province, probably our greatest hope for major new fields, a drop of 60%

Estimated proved reserves of natural-gas liquids

Includes condensate, natural gasoline, and liquefied petroleum gases
(Thousands of barrels)

	Proved reserves* (1-1-58)	1958 discoveries	1958 extensions and revisions	1958 production	Proved reserves As of 1-1-59	Proved reserves Year's change	Proved reserves Per cent of U. S.
Arkansas	37,140	314	600	3,054	35,000	—2,140	0.6
California	305,729	400	22,302	30,431	298,000	—7,729	4.8
Colorado	10,965	80	—378	867	9,800	—1,165	0.2
Illinois	11,793	24	—1,625	2,192	8,000	—3,793	0.1
Indiana	114	3	4	21	100	—14	....
Kansas	189,155	2,700	24,258	6,113	210,000	20,845	3.4
Kentucky	5,707	90	140	1,637	4,300	—1,407	0.1
Louisiana	1,019,198	7,000	61,608	49,806	1,038,000	18,802	16.8
Michigan	1,237	50	188	113	1,362	125	....
Mississippi	54,401	61	700	2,962	52,200	—2,201	0.8
Montana	7,805	20	—524	301	7,000	—805	0.1
Nebraska	7,135	0	149	614	6,670	—465	0.1
New Mexico	320,548	360	—20,370	17,538	283,000	—37,548	4.6
North Dakota	22,700	0	3,000	1,200	24,500	1,800	0.4
Ohio	1,810	25	126	21	1,940	130	....
Oklahoma	342,643	4,500	41,323	33,466	355,000	12,357	5.8
Pennsylvania	3,460	50	450	100	3,860	400	0.1
Texas	3,271,617	70,000	607,649	199,266	3,750,000	478,383	60.9
Utah	91	0	—4	5	82	—9	....
West Virginia	22,912	32	1,300	4,744	19,500	—3,412	0.3
Wyoming	51,165	1,000	3,450	3,115	52,500	1,335	0.9
Others	35	0	1	3	33	—2	....
Total United States	**5,687,360**	**86,709**	**744,347**	**357,569**	**6,160,847**	**473,487**	**100.0**

*Source: American Gas Association.

in wildcat drilling in 1958 (from 91 wells to 27) meant a 50% cut in new fields found (16 in 1957 vs. 8 in 1958).

In Utah, the great white hope for new oil in recent years, only 1 new oil field was found out of 84 attempts; 4 gas fields and 1 condensate field helped soften the blow, but wildcats dropped to the 84 figure from 121 the previous year, when 19 new fields were found.

On the other hand, wildcatting was on the increase in Alabama, Arizona, Indiana, New York, Ohio, Oklahoma, and Pennsylvania; Kansas and New Mexico held their own at about the same level as 1957.

The chart on "giant" oil fields* shows six new additions to the list during 1958. All of these came from revisions and extensions in near-giants of the past. Two are in Louisiana offshore, and one each appeared in Southwest Texas, California, Illinois, and Montana.

*These giant fields with 100 million barrels or more reserves are marked with an asterisk in the tables of production and estimated remaining primary reserves for the larger fields of the United States. These tables appear following this article.

How "giant" fields compare with all fields (crude oil)

(Millions of barrels)

State	Number giants	1958 production All fields	1958 production Giant fields	1958 production Giants per cent	Estimated ultimate All fields	Estimated ultimate Giant fields	Estimated ultimate Giants per cent	Remaining reserves All fields	Remaining reserves Giant fields	Remaining reserves Giants per cent
Texas	80	910.62	380.73	41.8	36,413	23,148	63.6	14,754	9,632	65.3
California	41	314.04	240.00	76.4	15,468	13,078	84.5	4,055	3,173	78.2
Louisiana	29	279.89	132.07	47.2	9,952	4,334	43.5	5,238	2,065	39.4
Oklahoma	20	199.95	82.69	41.4	10,061	5,163	51.3	2,228	949	42.6
Kansas	6	120.64	23.27	19.3	4,119	1,327	32.2	1,039	380	36.6
Wyoming	8	115.39	43.84	38.0	3,154	1,518	48.1	1,499	582	38.8
Illinois	7	82.08	42.55	51.8	2,784	1,585	56.9	707	285	40.3
New Mexico	5	96.04	31.45	32.7	2,236	924	41.3	936	279	29.8
Arkansas	3	28.84	10.91	37.8	1,392	785	56.4	361	143	39.6
Mississippi	3	37.74	8.43	22.3	995	410	41.2	412	155	37.6
Montana	2	28.27	6.32	22.4	737	226	30.7	432	118	27.3
N. Y.-Pa.	2	8.53	7.84	91.9	1,583	839	53.0	180	84	46.7
Utah	2	24.26	12.70	52.3	428	348	81.3	387	263	68.0
Colorado	1	48.53	20.91	43.1	858	416	48.5	355	151	42.5
North Dakota	1	13.71	6.45	47.0	412	272	66.0	347	226	65.1
Other states	0	73.97	0	0	3,191	0	0	623	0	0
Total U. S.	210	2,382.50	1,050.02	44.1	93,783	54,373	58.0	33,553	18,485	55.1

Journal survey of proved reserves

ON THESE PAGES are the estimated remaining reserves of crude oil and condensate for the larger fields of the United States. Eligibility for this list requires a 1958 production rate of at least 1,000 bbl. per calendar day.

Those major fields with an ultimate-recovery estimate of 100 million barrels or more are flagged by asterisks and are included here regardless of daily production today; Powell field, in East Texas, for instance, produced only 284,000 bbl. in 1958, but its cumulative production of 126,622,000 bbl. certainly qualifies it to go down in history as one of our major fields. There are now 210 of these giant fields on record. The largest of them all, of course, is the great East Texas field, with a cumulative production of 3,352,174,000 bbl. and a remaining reserve of 1,758,826,000 bbl.; this means an ultimate figure of more than 5 billion barrels for the largest field in the United States.

Figures in these tables are in thousands of barrels, and refer to primary recovery only. The "Number of Wells" figure includes those producing oil or lease condensate. Figures under "Productive Acres" apply to the largest reservoir only. All figures are as of January 1, 1959.

ARKANSAS

Field	1958 prod.	Cum. prod.	Est. res.	No. wells	Prod. acres
Atlanta	367	17,317	2,683	33	4,200
Buckner	366	13,333	10,667	44	1,200
Dorcheat-Macedonia	605	19,888	5,112	86	2,500
Eldorado, East	1,337	19,638	13,362	445	2,500
Fouke	1,242	17,214	10,786	150	1,800
Kiblah	465	2,325	3,675	50	750
*Magnolia	4,057	95,009	78,991	103	4,300
McKamie-Patton	1,235	21,492	42,508	41	1,800
Midway	1,801	40,006	32,994	45	1,800
*Schuler	2,216	85,450	20,550	160	5,000
*Smackover	4,636	461,533	43,467	1,725	16,000
Stephens	1,728	31,432	13,568	725	4,800
Urbana	1,085	16,711	16,289	435	2,000
Village	714	19,140	4,860	105	3,000
Wesson	2,317	33,927	16,073	212	1,800

APPALACHIAN

*Allegany	1,461	154,929	28,090	..	50,000
*Bradford	6,384	599,906	56,266	..	100,000

CALIFORNIA

Field	1958 prod.	Cum. prod.	Est. res.	No. wells	Prod. acres
Coastal Region					
Aliso Canyon	2,015	31,447	23,553	117	1,100
Bardsdale	576	8,064	6,936	87	400
Casmalia[2]	237	19,665	7,335	63	1,200
Castaic Junction	1,428	8,891	16,109	55	1,100
*Cat Canyon, West	3,933	90,350	49,650	279	3,200
Del Valle	485	20,795	6,205	80	650
*Elwood	929	99,225	10,775	38	500
Fillmore	2,529	6,163	23,837	44	850
Gato Ridge	764	25,229	9,771	43	400
Guadalupe	699	5,647	19,353	62	1,000
Honor Rancho	2,304	10,895	24,105	39	650
Lompoc[2]	153	29,068	10,932	102	2,100
Montalvo, West	2,468	8,711	21,289	47	900
Newhall-Potrero	2,872	48,612	31,388	126	1,400
*Orcutt	1,050	120,621	14,379	252	3,650
Oxnard	3,002	13,638	26,362	87	1,100
Placerita	1,345	29,541	15,459	330	700
Ramona	477	14,929	6,071	123	600
*Rincon	3,504	64,484	35,516	287	1,550
*San Ardo	10,873	79,694	120,306	686	4,100
San Miguelito[1]	1,503	43,169	21,831	107	400
*Santa Maria Valley	2,213	128,477	31,523	369	6,400
Saticoy	2,829	6,325	28,675	51	500
*South Mountain	7,007	73,092	76,908	464	2,900
Torrey Canyon[2]	137	11,660	18,340	72	250
*Ventura	21,105	604,018	220,982	1,108	3,350
Zaca Creek	666	12,446	9,554	38	450
Los Angeles Basin					
Bandini	581	2,716	6,284	51	250
Belmont Offshore	1,077	2,631	12,369	30	250
Beverly Hills	801	7,063	12,937	25	250
*Brea-Olinda	6,379	264,281	65,719	620	2,500
*Coyote, East	1,855	78,513	21,487	283	1,250
*Coyote, West	2,088	190,586	34,414	316	1,000
*Dominguez	3,734	218,726	46,274	340	1,500
*Huntington Beach	19,512	632,910	202,090	1,762	5,400
*Inglewood	4,419	212,404	47,596	525	1,000
*Long Beach	6,185	812,114	62,886	1,173	1,300
*Montebello	1,353	168,663	16,337	312	1,250
Newport, West	1,511	23,845	18,155	267	1,200
Playa del Rey	446	59,371	5,629	128	450
*Richfield	2,132	133,571	24,429	433	1,450
Rosecrans	975	77,608	12,392	208	550
Sansinena	2,597	23,850	41,150	142	650
*Santa Fe Springs	3,899	572,375	42,625	582	1,300
*Seal Beach	3,882	153,608	46,392	265	800
Sunset Beach	493	4,733	5,267	74	250
*Torrance	3,083	151,869	38,131	829	5,250
Whittier	451	24,723	5,277	154	650
*Wilmington	29,717	829,475	320,525	2,926	7,500
Yorba Linda	1,311	8,160	16,840	185	700
San Joaquin Valley					
Bellevue, West	391	938	3,062	8	150
Belgian Anticline	2,799	24,963	25,037	150	1,500
Belridge, North	483	64,619	7,381	88	1,900
*Belridge, South	4,270	75,203	49,797	1,224	7,650
*Buena Vista	6,862	470,176	104,824	1,035	15,500
*Coalinga, East	4,216	317,499	57,501	922	7,200
*Coalinga, Nose	15,353	298,166	176,834	104	4,100
*Coalinga, West	2,234	185,165	24,835	891	11,000
*Coles Levee, North[1]	4,584	99,120	50,880	156	3,500
Coles Levee, South	848	18,246	9,754	35	3,300
*Cuyama, South	12,461	114,508	135,492	200	2,800
*Cymric	3,077	70,032	34,968	467	2,750
*Edison	3,809	80,193	39,807	760	6,250
*Elk Hills	5,375	247,429	502,571	[2]284	18,300
*Fruitvale	2,742	74,466	30,534	418	2,950
Gosford, East	1,095	6,185	8,815	45	700
*Greeley	2,987	79,991	40,009	53	1,900

(1) Excludes D-7 and D-8 zones carried under Ventura field.
(2) Field largely shut in during 1958.

Field	1958 prod.	Cum. prod.	Est. res.	No. wells	Prod. acres
CALIFORNIA (Continued)					
Guijarral Hills	2,768	34,023	25,977	108	2,300
Helm	837	18,638	9,362	78	4,000
*Kern Front	2,181	93,095	26,905	707	4,300
*Kern River	4,387	343,524	46,476	2,919	8,350
*Kettleman N. Dome	4,500	422,206	52,794	280	13,100
*Lost Hills	1,319	82,095	17,905	685	3,600
McDonald Anticline	514	3,771	5,229	60	500
*McKittrick	1,119	104,421	15,579	280	1,150
*Midway-Sunset	13,107	856,430	153,570	3,668	26,200
*Mount Poso	2,942	122,146	37,854	443	3,300
Mountain View	1,531	64,193	20,807	230	2,800
Paloma[1]	727	36,752	11,248	55	5,100
Premier	1,295	24,979	15,021	310	2,000
Pyramid Hills	476	4,640	5,360	155	800
Raisin City	1,799	23,975	16,025	138	1,500
*Rio Bravo	3,626	89,590	45,410	95	1,950
Riverdale	488	14,653	5,347	34	1,050
Rosedale Ranch	553	3,433	5,567	40	500
Round Mountain	1,046	48,208	11,792	199	1,300
Russell Ranch	2,529	49,087	35,913	158	1,300
Strand	634	9,477	10,523	34	650
Tejon-Grapevine	1,313	16,744	16,256	194	1,800
Tejon Hills	464	9,400	6,600	223	900
Tejon, North	891	969	14,031	14	500
Ten Section	1,490	61,303	18,697	107	1,900
Vallecitos	681	1,275	5,725	14	150
Wheeler Ridge	2,230	18,408	26,592	140	850

(1) Figures do not include condensate. (2) Does not include 685 shut-in producers.

SOUTHEASTERN STATES

Field	1958 prod.	Cum. prod.	Est. res.	No. wells	Prod. acres
ALABAMA					
Citronelle	4,545	10,677	24,323	152	6,000
Gilbertown & East	376	6,829	3,171	62	2,500
Pollard	769	5,223	4,777	35	1,000
FLORIDA					
Sunniland	445	5,724	2,276	11	400
MISSISSIPPI					
Baxterville	4,819	66,171	28,829	166	3,400
Bolton	1,260	3,887	16,113	33	1,500
Brookhaven	2,396	48,250	26,750	80	6,000
Church Hill	655	4,972	5,028	31	1,450
*Cranfield	1,428	48,689	51,311	66	7,800
Deamond	959	1,065	3,935	17	700
Eucutta	1,571	26,159	13,841	128	5,000
*Heidelberg	3,205	51,671	58,329	205	4,600
La Grange & South	1,621	32,732	17,268	111	1,300
Little Creek	1,440	1,440	50,560	43	3,000
Mallalieu	727	28,304	11,696	32	2,000
Martinsville	479	566	4,434	15	600
Overton	497	3,009	4,991	25	800
Pistol Ridge-Maxie	1,185	4,610	20,390	155	9,000
Soso	4,204	17,995	32,005	95	4,500
*Tinsley	3,800	153,472	46,528	253	9,600
Yellow-Creek, East North and West	1,360	15,518	9,482	137	3,500

TRISTATE

Field	1958 prod.	Cum. prod.	Est. res.	No. wells	Prod. acres
ILLINOIS					
Albion	1,377	19,070	15,930	403	5,500
Allendale	477	10,174	4,826	401	8,000
Benton	606	34,563	7,437	237	3,500
Boyd	668	13,045	4,955	110	1,500
*Bridgeport (old)	5,280	271,015	33,985	3,635	30,000
Centralia	3,480	45,331	18,669	560	3,400
*Clay City	7,972	204,551	20,449	3,380	85,000
Concord	447	5,155	4,845	124	1,600
*Dale	2,485	63,841	36,159	1,652	20,000
Eldorado	408	5,929	9,071	162	2,200
Gila	370	370	4,630	26	600
Herald	487	9,922	13,078	368	4,500
Inman, East	1,154	16,050	14,950	348	3,300
Inman, West	383	4,727	3,273	215	2,900
Iola	416	10,199	9,801	205	3,000
Johnsonville	992	32,504	15,496	377	8,900
Kincaid	630	2,920	15,080	90	1,500
*Loudon	13,158	222,804	77,196	2,103	25,000
Mattoon	370	13,197	2,803	433	5,100
Mt. Auburn	638	1,612	8,388	115	1,500
Mt. Carmel	451	11,885	8,115	376	4,500
*New Harmony	4,430	95,208	19,792	1,310	23,500
Phillipstown	691	17,788	7,212	401	5,700
*Robinson (old)	2,755	176,850	13,150	6,700	37,500
Roland	2,155	35,471	17,529	625	8,600
St. James	395	14,495	5,505	170	3,000
Sailor Springs	1,531	30,777	11,223	783	13,200
*Salem	6,475	264,602	85,398	2,381	14,400
INDIANA					
Cannelburg (old)[1]	1,009	25,721	14,279	667	6,000
Griffin[2]	2,152	44,608	15,392	633	6,000
Mt. Vernon	396	8,766	2,234	164	1,700
Owensville Cons.[3]	511	3,715	16,285	150	1,600
Springfield	670	8,924	5,076	274	2,000
Union-Bowman[4]	1,494	9,152	10,848	549	12,500

(1) Cannelburg area includes Princeton, Shelburn, Troy, Veale, and West Francisco. (2) Jimtown (Gibson Co.) cons. 6/1958 into Griffin. (3) Owensville, Owensville East, and King Cons. June 1958. (4) Patoka, North, Union, West Cons. Sept., 1958.

Field	1958 prod.	Cum. prod.	Est. res.	No. wells	Prod. acres
KENTUCKY					
Apex	545	3,239	7,761	405	3,600
Birk City	430	7,779	7,221	407	3,500
Cleopatra	430	2,445	7,555	97	900
Glenville	448	1,516	6,484	120	1,100
Green	1,644	1,644	10,356	200	6,000
Hardeson	427	1,262	8,738	105	1,000
Poole	916	16,038	10,962	520	5,100
Sebree	302	1,555	3,445	112	1,500
Smith Mills, North	504	3,661	9,339	50	600
Uniontown	408	16,564	4,436	249	4,000

MICHIGAN

Field	1958 prod.	Cum. prod.	Est. res.	No. wells	Prod. acres
Coldwater	636	18,586	6,414	75	3,200
Deep River	275	24,952	13,048	106	1,350
Eden	190	2,468	5,532	40	600
Kawkawlin	570	10,597	4,403	390	7,000
Norwich, East	328	5,734	4,266	100	4,200
Reed City	566	41,701	8,299	170	5,600
Reynolds	671	2,020	2,980	50	700
Rose City	292	3,688	2,312	120	4,600
Scipio	445	520	11,480	25	600
West Branch	332	9,042	22,958	260	4,600

LOUISIANA

Field	1958 prod.	Cum. prod.	Est. res.	No. wells	Prod. acres
NORTH LOUISIANA					
Antioch	406	632	7,368	6	200
Benton	699	12,669	5,331	13	2,300
Bethany, South	929	2,980	12,020	73	3,200
*Caddo	6,493	245,103	154,897	6,200	80,000
Catalhoula Lake, West	601	5,816	8,184	58	1,800
Colquitt	1,080	3,480	6,520	38	3,000
Cottage Grove	405	1,893	4,107	85	2,000
*Cotton Valley	3,277	95,950	19,050	273	9,600
*Delhi-Big Creek	5,320	99,651	125,349	330	12,000
De Soto-Red River	493	65,608	9,392	270	8,000
Esperance Point	1,424	7,985	6,015	54	6,000
*Haynesville[1]	1,725	131,272	23,728	332	13,500
Haynesville, East	831	14,204	10,796	133	7,100
*Homer	630	85,738	14,262	320	3,000
Killens Ferry	425	515	9,485	35	700
Knowles	756	11,437	14,563	43	1,800
*Lake St. John	2,076	70,481	44,519	100	11,000
Lisbon	1,102	32,902	29,098	233	14,000
Locust Ridge	706	2,623	13,377	26	1,200
Nebo	1,419	42,658	17,342	160	7,000
N. Shongallo-Red Rock	1,215	5,040	14,960	131	3,000
Olla	1,133	42,128	12,872	163	8,000
Redland	463	1,294	3,706	50	1,000
*Rodessa[2]	1,706	124,078	60,922	373	38,000
Rodney Island	544	1,664	3,336	18	900
Ross Bayou	410	2,707	4,293	27	800

Field	1958 prod.	Cum. prod.	Est. res.	No. wells	Prod. acres
NORTH LOUISIANA (Continued)					
Ruston	413	4,390	5,610	32	1,500
Sligo	1,423	15,341	12,659	151	4,000
Urania-Georgetown	751	39,011	5,989	331	....
Waskom-Greenwood	1,100	6,137	18,863	337	5,000
(1) Inc. Arkansas portion; (2) Incl. Texas portion.					
SOUTH LOUISIANA					
Anse La Butte	1,669	40,103	20,897	139	1,080
Avery Island	2,588	40,353	37,647	93	910
Avondale-West	654	4,978	6,022	17	500
Bancroft & No. & So.	540	13,190	16,810	32	1,100
Barataria	385	22,180	10,820	23	720
Bastian Bay	966	5,587	10,413	35	1,500
Bateman Lake	2,835	20,816	37,184	74	1,200
Bay de Chene	1,583	13,396	21,604	67	1,900
Bay St. Elaine	3,158	33,147	35,853	129	1,600
Bayou Bleu	911	16,067	9,933	80	800
Bayou Choctaw	1,119	13,002	17,998	80	1,220
Bayou Couba	754	7,955	10,045	44	680
Bayou des Allemands	631	10,209	5,791	36	800
Bayou des Glaise	479	5,679	4,321	15	540
Bayou Fordoche	504	3,618	10,382	21	1,120
Bayou Mallet and So.	763	13,307	14,693	63	2,800
*Bayou Sale	2,258	61,475	40,525	83	4,300
Bayou White	386	3,382	8,618	18	620
Big Bayou Pigeon	378	1,100	6,900	13	520
Big Lake	689	3,413	8,587	22	1,840
Black Bay, West	1,889	2,968	27,032	89	1,800
Black Bayou	498	22,457	15,553	27	1,030
Bon Air	397	3,904	4,096	12	400
Bosco	595	36,084	9,916	38	2,600
Breton Sound, Blk. 20	416	2,230	8,770	13	440
Bully Camp	1,229	13,189	19,811	71	1,700
Burrwood	408	677	5,323	12	300
*Caillou Island	10,856	127,772	90,228	337	5,000
Cameron Meadows	433	47,965	2,035	31	400
Cankton, North	789	10,920	19,080	59	2,400
Chacahoula	1,066	25,791	21,209	66	2,300
Charenton	1,209	30,186	22,814	169	2,400
Church Point	457	1,431	10,569	25	2,500
Clear Creek	956	3,460	30,540	42	2,460
Clovelly	971	5,735	18,265	36	760
Cote Blanche Bay, West	1,901	28,145	25,855	84	3,300
Cote Blanche Island	1,060	3,655	10,345	27	1,100
Cowpen Creek	547	2,020	21,980	37	1,440
Cox Bay	1,842	18,950	24,050	68	2,240
Crowley, North	927	30,231	14,769	58	1,900
Dave Haas	397	8,704	6,296	21	700
Deep Lake	752	1,872	13,128	55	2,700
Delacroix Island	708	9,036	5,964	25	980
Delta Duck Club	979	10,586	10,414	46	1,080
*Delta Farms	2,882	77,812	32,188	115	6,300
Delta Farms, West	431	3,778	18,222	16	800
Dog Lake	751	16,447	9,553	41	1,100
Duck Lake	2,234	21,100	26,900	72	3,240
Egan	1,786	28,770	10,230	48	2,600
Ellis	587	3,444	13,556	26	1,120
Elton, North	447	2,756	6,224	17	1,200
*Erath	5,601	76,021	73,979	82	3,200
Fausse Point	1,469	11,192	23,808	58	2,240
Fordoche	547	7,755	14,245	35	1,440
Four Isle Dome	383	2,719	2,291	18	1,000
Franklin	631	2,782	11,218	23	920
Garden Island Bay	1,330	28,352	21,648	93	3,200
Gibson, East and N. E.	792	35,082	9,918	58	2,320
Gillis and English Bayou	398	27,838	14,162	37	1,560
*Golden Meadow	2,663	70,710	39,290	244	3,000
Good Hope	856	23,894	14,106	35	840
*Grand Bay	1,230	59,153	47,847	138	3,000
Grand Coulee	562	2,285	8,715	23	500
Grand Lake	1,036	16,257	13,743	42	1,800
Gueydan and West	924	30,739	11,261	55	2,240
Hackberry, East	801	48,835	19,165	77	1,800
*Hackberry, West	4,201	59,324	74,676	179	1,600
Hollywood	476	5,489	5,511	17	1,400
Horseshoe Bayou	716	15,853	17,147	25	1,000
Hurricane Creek	444	5,609	16,391	34	1,440
Iberia	677	50,905	9,095	55	1,000
*Iowa	1,745	87,246	39,754	90	2,000
Jeanerette	1,131	24,758	9,242	66	2,120
*Jennings	871	109,111	22,889	129	2,300
Kent Bayou	562	3,152	7,848	17	680
Kinder	764	3,454	24,546	45	1,760
Krotz Springs	2,288	4,771	22,229	35	1,400
*Lafitte	2,684	94,424	35,576	105	3,600
Lake Barre	2,498	28,825	15,175	87	2,400
Lake Chicot	710	15,956	7,044	28	840
Lake Mongoulois	668	9,237	11,763	29	1,080
Lake Palourde, East	1,995	4,528	22,472	48	2,100
Lake Pelto[1]	3,018	32,698	25,302	106	3,400
Lake Salvador	1,625	27,426	28,574	66	2,600
Lake Verret, West	1,259	27,240	17,760	57	1,720
*Lake Washington	9,599	40,771	119,229	313	9,000
La Pice	738	12,936	15,064	37	800
Larose	940	3,568	13,432	34	1,100
*Leeville	3,797	64,950	45,050	169	3,400
Little Lake	2,067	11,728	43,272	70	2,700
Little Temple	539	796	9,204	21	300
Live Oak	782	2,113	8,887	31	1,000
Lockport	759	24,352	21,648	73	1,340
Main Pass, Blk. 35	2,930	19,458	53,542	77	2,920
Napoleonville	609	5,490	15,510	41	1,700
Neale	453	16,094	11,906	35	4,000
Opelousas	483	1,637	26,363	11	1,000
Orange Grove	418	1,609	8,391	17	600
Paradis	2,223	58,995	25,005	77	3,400
Pecan Lake, South	383	1,951	17,049	34	3,900
Pine Prairie	687	20,945	8,055	72	2,400
Plumb Bob	553	3,995	5,005	25	900
Point-a-la-Hache	1,293	19,229	18,771	87	2,700
Port Barre	683	29,536	14,464	64	1,560
Potash	497	9,987	5,013	23	880
*Quarantine Bay	2,752	59,693	52,307	118	4,060
Raceland	440	12,151	9,849	19	880
Roanoke	377	19,324	6,676	29	1,560
Romere Pass	2,795	29,655	28,345	63	3,780
Section 28	1,111	14,137	22,863	54	1,690
Shuteston	718	8,933	21,067	46	1,920
St. Gabriel	593	26,011	13,989	41	1,640
Stella	405	5,287	12,713	17	1,000
Sweet Bay Lake	891	2,608	13,392	30	1,050
Sweet Lake	472	13,952	6,048	28	1,600
Tepetate	409	20,396	4,604	37	1,400
Tepetate, North	370	10,031	17,966	45	1,840
Tepetate, West	662	18,601	2,399	28	1,500
Thornwell, South	391	918	11,082	9	800
Tigre Lagoon	625	5,524	4,475	20	1,400
University	646	41,196	14,804	48	1,880
Valentine	1,574	18,527	29,473	85	3,080
*Venice	4,198	76,224	56,776	136	1,400
Ville Platte	778	57,499	19,501	99	5,600
*Vinton	1,688	90,258	39,742	151	1,560
Washington	1,478	3,306	11,694	29	2,200
*Weeks Island	6,796	82,059	59,941	165	3,300
West Bay	4,176	40,108	52,892	175	4,000
West Delta, Blk. 83	494	640	8,360	18	600
White Castle	838	26,130	14,870	42	820
White Lake, East	1,097	20,603	27,397	50	2,120
White Lake, West	658	5,249	10,751	29	1,300
OFFSHORE LOUISIANA					
*Bay Marchand, Blk. 2†	8,421	30,552	69,448	180	5,600
Belle Isle†	822	6,711	18,289	38	1,400
Eugene Island:					
Block 18	642	2,712	12,288	14	1,100
Block 32	899	3,918	21,082	24	1,800
Block 45	193	1,699	4,301	4	240
Block 110	55	247	2,753	4	320
Block 126	3,286	13,871	51,129	66	4,500
Block 128	1,669	4,189	35,811	38	2,000
Grand Isle:					
Block 16	1,722	2,916	47,084	47	3,500
Block 18	1,909	9,442	29,558	35	2,400
Block 47	2,128	2,586	57,414	52	3,800
*Main Pass, Block 69	6,917	30,818	169,182	180	10,000
Ship Shoal, Block 154	1,524	2,824	38,176	45	2,500
*South Pass, Block 24†	15,067	67,780	167,220	469	12,000
*South Pass, Block 27	3,579	8,039	101,961	110	8,000
*Timbalier Bay†	8,558	34,363	122,637	291	11,000
*West Delta, Block 30	4,476	8,738	121,262	135	8,300
West Delta, Block 53†	1,032	3,742	8,258	13	1,080
†Combined onshore and offshore.					

KANSAS

Field	1958 prod.	Cum. prod.	Est. res.	No. wells	Prod. acres
Antelope Cons.[1]	420	809	4,191	125	3,000
Barry	546	9,367	4,633	71	1,700
*Bemis-Shutts	5,178	166,145	183,855	1,125	30,000
Bloomer	972	49,366	15,634	277	5,600
Boyd	446	8,772	3,228	130	3,900
Browning	1,046	9,967	11,033	117	1,800
Burrton-Haury	641	51,554	5,446	330	11,000
Catherine, South	387	2,708	3,292	61	1,500
*Chase-Silica	3,951	213,507	46,493	1,330	59,000
Chitwood	694	9,599	3,401	69	2,500
Cooper	1,298	12,031	11,969	241	9,000
Demalorie-Sowder	392	15,274	4,726	145	2,200
Diebolt	504	2,890	8,110	99	2,100
*Eldorado	4,369	236,682	43,318	1,660	22,500
Fairport	1,063	29,872	9,128	253	5,000
Fox Bush	480	21,670	5,330	135	4,500
Garfield Cons.[2]	1,109	5,847	16,153	247	8,000
Gates	778	10,092	5,908	153	6,300
Genesco-Edwards	1,935	62,759	23,241	433	10,600
Gladys	1,690	6,377	24,623	235	4,500
Gorham	1,203	63,193	21,807	431	15,800
*Hall-Gurney	3,325	79,801	27,199	1,235	29,600
Holley	527	2,138	3,862	116	2,500
Interstate	675	1,398	13,602	77	1,500
Irvin	626	2,909	5,091	85	900
Iuka-Carmi	1,058	20,643	11,357	250	9,000
Jelinek	507	5,481	4,519	80	2,700
*Kraft-Prusa	2,949	84,122	35,878	680	27,000
Larned	529	3,268	4,732	75	2,700
Leiker, East	558	1,645	5,355	45	800
Leslie (Stevens)	445	1,039	3,961	31	600
Lindsborg[3]	381	10,061	9,939	151	3,200
Lost Springs	494	11,998	3,002	265	8,000
Madison	416	11,037	3,963	133	3,750
Marcotte	1,793	19,124	15,876	345	8,000
Medicine Lodge-Boggs	338	4,074	1,926	59	3,000
Morel	1,480	24,687	12,313	233	7,500
Mueller (Sittner)	420	8,249	4,751	107	4,600
Nichols	706	1,556	9,444	55	1,200
North Hampton	409	4,432	4,568	55	1,500
Norton	668	4,011	5,989	117	2,200
Ogallah	702	4,379	5,621	77	3,800
Otis-Albert	583	12,486	3,514	205	13,500
Paden	465	4,345	5,655	89	1,800
Ray	1,366	22,454	7,546	162	4,350
Rhodes	688	5,166	8,834	159	5,500
Ritz-Canton	1,320	49,556	16,444	387	14,500
Rock	454	5,139	9,861	78	1,500
Russell	712	17,435	3,565	193	5,300
Sallyards	866	15,309	9,691	194	2,500
Seely-Wick	721	26,862	8,138	260	4,500
Solomon	377	4,165	2,835	98	3,500
Spivey-Grabs	1,924	7,274	22,726	328	16,000
Stoltenberg	811	41,282	8,718	308	13,000
Sugarloaf, SE	378	1,838	8,162	48	900
Teeter	386	17,862	7,138	177	3,500
Thrall-Agard	490	31,710	10,290	307	3,700
*Trapp	3,497	165,596	44,404	1,197	37,000
Trico	1,293	4,671	14,329	165	3,000
Unger	1,133	2,658	12,342	151	2,600
Welch-Bornholdt[4]	1,075	30,465	10,535	420	10,500
Wellington	499	9,818	4,182	138	2,700
Wiggins	425	2,097	5,903	61	1,200
Workman, NW Cons.	457	1,030	6,970	60	1,100
Zenith-Peace Creek	413	39,953	10,047	129	2,500
Eastern-Shallow Stripper	5,731	237,218	64,782	8,000	.....

(1) Antelope Incl.: Antelope & Antelope, SE Cons. 10/1957; Beauty, Beauty, So., Propp, Quarry Siding, Quarry Siding, SE. Cons. 9/1958. (2) Garfield Cons. 9/1958; Incls. Garfield, and North Garfield. (3) Lindsborg Cons. Salemborg added 10/1957 to Lindsborg Cons. (4) Welch-Bornholdt-Cons. 2/1958; Incl. Welch, North.

OKLAHOMA

*Allen	1,590	85,003	14,997	884	8,500
Atlantic	727	9,539	4,461	148	900
*Avant	322	103,094	3,906	578	12,500

Field	1958 prod.	Cum. prod.	Est. res.	No. wells	Prod. acres
OKLAHOMA (Continued)					
Bald Hill	745	55,909	7,091	734	32,000
Beebe-Konawa	625	30,726	6,274	461	10,000
*Bowlegs	619	138,409	11,591	184	5,000
Bradley	2,741	11,570	18,430	174	5,300
Bradley, East	498	1,458	5,542	23	500
Bradley, NE	374	2,178	3,822	9	300
*Burbank	14,548	348,485	126,515	2,515	5,000
Cache Creek	827	15,223	8,777	288	3,000
Camrick	512	957	9,043	74	1,500
*Cement	4,405	93,397	31,603	1,460	15,000
Ceres, South	605	6,832	3,168	156	1,400
Chickasha	675	3,733	8,267	229	2,500
Cumberland	1,474	54,557	20,443	139	1,800
*Cushing	2,702	408,181	46,819	1,819	28,000
Davenport	959	24,158	9,842	310	3,500
Dilworth	517	17,442	15,558	358	9,500
Dora	525	9,159	3,841	125	2,500
Doyle	2,421	24,572	17,428	322	3,500
*Earlsboro	290	135,202	4,798	93	7,500
*Edmond, West	1,153	108,420	21,580	567	32,000
*Elk City	2,806	50,237	69,763	304	7,700
Eola	3,188	19,346	46,654	100	4,000
Falls, NE	436	1,257	4,743	36	800
*Fitts	800	114,939	10,061	442	5,000
Flat Rock	520	45,886	14,114	567	8,000
Garber	826	64,951	8,049	531	6,500
*Glennpool	2,773	258,945	31,055	1,857	24,000
*Golden Trend	13,106	166,501	133,499	1,980	7,700
Guthrie Lake, East	666	1,803	12,197	115	2,000
*Healdton	2,331	231,561	18,439	2,067	9,300
Henderson	385	990	5,010	65	900
*Hewitt	3,084	155,028	29,972	1,440	15,000
Holdenville	476	15,375	12,625	540	6,000
Hoover, North	1,472	15,649	15,351	490	5,000
Hoover, SE	945	1,331	3,669	27	600
Iron Post	925	13,975	9,025	427	10,000
Jones	815	7,040	5,960	139	3,600
Komalty	680	844	7,156	250	5,000
Knox	1,045	34,505	24,495	407	5,500
Lauderdale	645	19,210	7,790	272	6,000
Lindsay, NW	510	2,511	3,489	20	800
*Little River	430	129,594	5,406	140	5,600
Loco	1,372	20,167	14,833	923	8,500
Lucien	743	43,916	8,084	198	5,200
Madill, North	698	2,601	7,399	74	2,500
Mannford	574	11,795	8,205	507	8,000
Maud	690	16,850	7,150	91	1,800
Moore, NE	391	825	4,175	30	800
Moore, West	2,553	14,654	35,346	309	12,000
Mt. Vernon	783	3,931	6,069	75	1,200
Mt. Vernon, SW	501	2,742	7,258	123	1,600
Naval Reserve	1,498	30,998	18,002	489	6,500
New England	367	3,347	4,653	120	1,700
*Oklahoma City	3,290	710,742	59,258	560	14,300
Olympic	1,341	33,800	7,200	366	5,000
Oscar	515	17,063	7,937	270	10,000
Pauls Valley	511	23,435	4,565	80	2,000
Peavine	543	6,673	6,327	67	2,000
Robberson	924	21,729	8,271	313	6,000
*Seminole	876	163,009	11,991	296	10,750
*Sho-Vel-Tum	25,823	499,244	300,756	7,105	69,000
Slick	552	40,653	7,347	287	3,500
*St. Louis	1,410	188,345	12,655	520	23,000
Stroud	556	24,285	5,715	440	4,500
*Tonkawa	331	126,909	3,091	121	5,500
Tonkawa, East	382	828	9,172	35	750
Walters	380	31,086	2,914	306	4,000
Washington, East	367	2,637	3,363	10	500
Wewoka	743	53,167	9,833	313	2,500
Wildhorse	601	20,961	5,039	420	4,700
Yale-Quay	1,927	42,090	14,910	334	1,000
N.E. Stripper Area	10,096	467,817	107,183	11,950	.....

NEW MEXICO

SOUTHEAST NEW MEXICO

Allison	410	1,731	5,269	10	500
Anderson Ranch	1,123	5,553	11,447	20	1,900
Arrowhead	524	22,667	7,333	98	5,100

Field	1958 prod.	Cum. prod.	Est. res.	No. wells	Prod. acres
NEW MEXICO (Continued)					
Artesia	819	11,651	12,349	383	11,500
Bagley	1,312	15,148	14,852	33	1,700
Bronco	762	3,815	16,185	15	400
Brunson	627	25,490	14,510	101	6,000
*Caprock & East	5,216	32,473	67,527	622	24,000
Caudill Devonian	835	4,149	15,851	15	750
Crossroads	1,402	10,183	24,817	27	750
Dean	1,204	4,518	20,482	30	1,000
*Denton	7,968	64,412	60,588	208	4,500
Dollarhide, West	2,510	17,534	22,466	178	5,000
Drinkard	1,738	46,396	28,604	460	19,000
Echols & North	677	4,071	5,929	11	500
*Eunice-Monument	11,674	304,278	73,722	1,603	65,000
Fowler	787	6,103	8,897	23	1,200
Gladiola	7,324	18,867	41,133	114	4,500
Grayburg-Jackson	1,318	35,855	20,145	381	15,000
Hare	583	12,046	16,954	82	3,400
*Hobbs	3,248	160,009	35,991	313	12,000
Jalmat	2,137	39,481	50,519	378	19,000
Justis	539	539	9,461	24	1,000
Kemnitz-Wolfcamp	1,589	2,227	14,773	32	1,500
King	897	1,699	3,301	16	600
Knowles & South	805	5,169	9,831	21	800
Langlie-Mattix	1,996	40,405	19,595	735	29,000
Loco Hills	429	17,424	7,576	229	11,000
Lovington	2,466	30,967	24,033	242	3,600
Maljamar	2,449	37,707	24,293	344	15,000
Moore	1,042	6,935	13,065	20	800
Paddock	433	11,933	8,067	102	4,500
Saunders and South	1,781	13,659	20,341	73	3,000
Skaggs	445	4,397	7,603	79	3,200
Square Lake	515	9,356	20,644	217	8,000
Terry-Blineberry	1,003	4,570	15,430	103	4,000
Townsend Wolfcamp	1,726	11,334	38,666	99	2,800
*Vacuum	3,348	84,994	40,006	476	19,000
Warren	1,604	9,922	14,078	49	1,200
NORTHWEST NEW MEXICO					
Bisti Gallup	4,978	6,149	13,851	286	24,000
Gallegos-Gallup	410	468	8,532	78	6,400
Verde-Gallup	873	1,334	10,666	96	7,000

ROCKY MOUNTAIN STATES

COLORADO					
Adena and South	4,965	26,820	23,180	140	10,000
Atwood, East	393	832	9,168	27	600
Badger Creek and West	383	3,591	4,409	47	1,200
Big Beaver	1,062	4,096	5,904	23	900
Bijou, West	462	462	9,538	14	400
Black Hollow	549	3,253	6,747	18	1,000
Bobcat	670	3,891	4,109	31	1,400
Cliff	553	3,022	3,978	31	1,200
Graylin	631	6,483	6,517	50	1,500
Little Beaver Creek	1,004	10,030	12,970	83	1,600
Little Beaver, East	750	3,675	13,325	55	1,800
McCallum, North	508	2,934	3,066	15	800
Mt. Hope	430	5,544	4,456	54	1,200
Pierce	830	1,737	3,263	20	400
Plum Bush Creek	1,138	4,268	5,732	41	1,500
*Rangeley	20,914	264,680	151,320	465	19,000
West Fork	380	741	9,259	15	400
Wilson Creek	2,396	39,528	20,472	38	3,900
Yenter	658	6,452	6,548	27	1,400
Zorichak Cons.[1]	415	809	9,191	32	1,500

(1) Pinneo & Pinneo, S.W. Consolidated May, 1958 into Zorichak.

MONTANA					
Cabin Creek	4,549	10,378	41,622	85	8,000
*Cut Bank (Darling, and Darling South)	2,306	88,476	17,524	1,147	53,000
Elk Basin—(See Wyoming):					
Glendive	632	3,810	6,190	12	1,000
Kevin-Sunburst	862	64,235	9,765	1,300	16,000
Outlook	439	575	9,425	16	1,500
Pennel	606	1,668	21,332	23	1,000
Pine Unit	5,386	16,178	36,822	135	9,000
Pondera	580	14,078	5,922	335	5,000
*Poplar, E. & McGowan	4,011	20,260	99,740	105	18,000
Sumatra and N.W.	1,570	7,069	14,931	68	3,000
Wolf Springs	575	1,569	8,431	29	2,000

Field	1958 prod.	Cum. prod.	Est. res.	No. wells	Prod. acres
NEBRASKA					
Allchin	916	916	4,084	15	300
Cook	502	2,173	7,827	10	300
Griffin Cons.	613	1,019	5,981	24	500
Heidemann	666	1,144	5,856	23	600
Juelfs	670	1,631	8,369	30	600
Lodgepole (Kimball)	488	3,035	9,965	41	1,000
Olsen	418	2,322	5,678	34	700
Sloss	2,055	5,377	6,623	79	4,900
Torgeson	402	2,128	3,872	33	750
Travis	652	2,869	4,131	26	500
Willson Ranch	592	685	4,315	16	400
NORTH DAKOTA					
Antelope Cons.[1]	1,070	2,114	27,886	61	5,000
*Beaver Lodge-Tioga[2]	6,448	46,037	225,963	535	46,000
Blue Buttes	1,452	3,088	32,912	120	9,500
Charlson	960	4,626	34,374	83	6,500
Newburg	698	725	4,275	66	2,500

(1) Antelope and Sanish Consolidated December 1957.
(2) Beaver Lodge-Tioga Cons.—Tioga, North removed from Consolidation, set up as separate pool in October 1958.

UTAH					
*Aneth	9,948	11,764	170,236	170	18,000
Ashley Valley	773	8,783	6,217	30	800
Cahone Mesa	431	470	9,530	9	700
McElmore Creek	3,219	3,250	26,750	61	4,800
Ratherford	4,286	4,330	27,670	63	5,000
*Red Wash	2,753	7,369	92,631	75	25,000
White Mesa	3,365	3,383	21,617	50	4,000
WYOMING					
Ash Creek and South[1]	1,018	5,406	9,594	49	1,800
Beaver Creek	2,227	10,805	29,195	34	5,400
Big Muddy	1,082	41,448	13,552	275	6,500
Big Sand Draw	2,501	28,518	26,482	21	2,000
Bonanza and East	4,519	27,784	42,216	53	600
Brooks Ranch	468	497	4,503	1	80
Byron	2,134	42,179	17,821	71	2,000
Circle Ridge	626	10,175	9,825	87	700
Clareton & South	1,134	15,516	22,484	700	30,500
Cole Creek and South	903	16,550	8,450	91	4,700
Cottonwood	4,788	11,173	35,827	48	9,000
Crooks Gap	438	8,660	9,340	8	200
Dead Horse Creek	746	996	4,004	30	80
Donkey Creek	1,390	2,248	12,752	14	800
*Elk Basin[1]	16,576	137,980	262,020	287	4,900
Elk Basin, South	694	6,765	8,235	25	500
Fiddler Creek	777	11,393	8,607	25	6,500
Frannie[1]	2,658	46,152	19,848	123	1,600
Garland	4,154	48,974	21,026	120	2,800
Gebo	1,147	10,398	4,602	43	600
Glenrock, South	3,388	28,310	21,690	195	7,000
Golden Eagle	899	6,500	13,500	12	600
*Grass Creek	3,617	67,088	32,911	395	6,000
Grieve Unit	2,777	5,497	19,503	18	1,200
*Hamilton Dome	5,903	56,287	53,713	170	3,000
Happy Springs-Jade	771	6,040	8,960	27	300
LaBarge and North	464	15,308	4,692	135	1,000
*Lance Creek	998	98,208	21,792	225	3,500
Little Buffalo Basin	2,164	15,244	21,756	30	4,800
*Lost Soldier	3,929	74,843	35,157	70	1,100
Meadow Creek & No.	2,135	18,623	17,377	188	5,400
Murphy Dome	2,532	9,949	25,051	21	1,000
Mush Creek	975	24,934	17,066	655	6,500
North Fork	1,634	2,781	17,219	5	400
*Oregon Basin	4,714	87,225	69,775	212	8,800
Pilot Butte	472	7,732	5,268	45	2,500
Pitchfork	619	3,394	4,606	9	200
Rock River	443	31,989	8,011	28	1,000
Sage Creek	374	5,003	8,500	16	800
*Salt Creek	4,865	374,161	45,838	1,071	22,000
Salt Creek, East	1,657	3,926	6,074	10	600
*Steamboat Butte	3,242	40,635	60,365	47	1,600
Sussez and West	2,786	23,635	13,365	162	4,500
Teapot, East	580	5,858	4,141	32	1,700
Torchlight	407	2,858	7,141	13	750
Wert	2,280	36,808	45,191	30	700
Winkleman Dome	2,804	16,258	26,742	23	900
Worland	374	14,141	8,858	29	6,400

(1) Includes Montana portion of field.

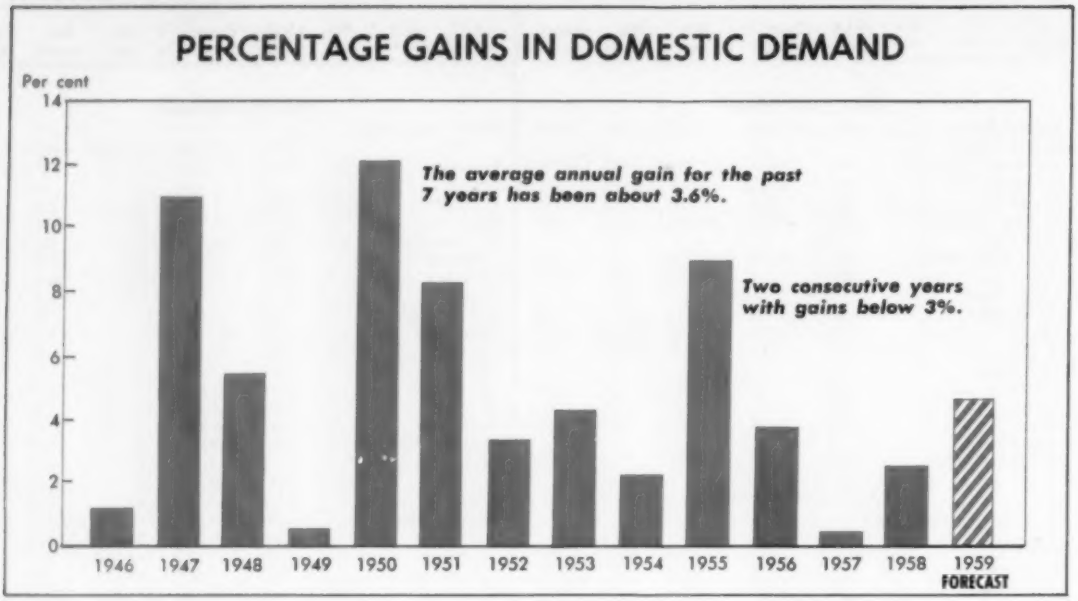
Field	1958 prod.	Cum. prod.	Est. res.	No. wells	Prod. acres
TEXAS					
RAILROAD DISTRICT 1:					
Big Foot	1,107	12,926	22,074	594	11,000
Charlotte	696	18,084	18,916	284	6,000
Crown, East (Navarro)	657	4,083	18,917	337	8,000
*Darst Creek	3,475	100,536	34,464	545	2,500
*Luling-Branyon	2,737	111,277	25,723	853	4,000
RAILROAD DISTRICT 4:					
*Agua Dulce-Stratton	5,249	146,601	78,399	448	10,000
Borregas	1,975	18,746	31,254	194	3,500
Fulton Beach	1,901	21,490	33,510	274	6,500
Garcia	538	16,055	8,945	119	3,300
*Government Wells North and South	1,455	79,530	20,470	518	9,600
Hagist	433	3,870	6,130	81	3,800
Hoffman	666	32,084	12,916	459	6,500
Kelsey	2,130	38,287	33,713	425	2,800
*La Gloria	3,231	70,102	79,898	187	4,000
Mustang Island	483	17,105	22,895	139	1,500
*Plymouth	4,039	103,496	56,504	275	4,000
Portilla	1,797	29,855	60,145	125	1,650
Red Fish Bay	612	8,957	11,043	82	1,200
Rincon	1,580	47,102	22,898	262	3,400
*Seeligson (all zones)	7,932	169,351	230,649	844	13,000
Seven Sisters	701	44,780	15,220	253	5,400
Sun	834	23,830	16,170	203	2,000
Taft (all fields)	761	24,005	13,995	125	3,000
Tijerina-Canales-Blucher	1,465	37,916	47,084	229	3,200
*White Point, East	2,194	68,225	41,775	391	5,000
Willamar and West	1,241	41,338	33,662	263	4,000
RAILROAD DISTRICT 2:					
Appling	2,159	3,123	26,877	37	1,500
Berclair	423	5,793	4,207	93	3,500
Bloomington	1,368	17,569	19,431	112	1,600
Burnell-Tulsita	2,727	36,364	30,636	138	1,800
Cottonwood Creek (So.)	407	5,286	6,714	47	1,800
Falls City	447	14,101	10,899	71	2,800
Francitas, No.	789	15,511	14,489	61	1,500
*Greta	1,502	75,183	34,817	200	2,800
Helen Gohlke	995	15,206	34,794	147	3,000
Heyser	549	43,712	6,288	172	3,400
Lake Pasture	400	2,919	12,081	43	1,700
Lolita	1,162	31,278	18,722	265	3,000
Mary Ellen O'Connor	1,188	8,046	41,954	156	4,500
McFaddin	443	24,201	10,799	58	2,000
Placeda	457	36,038	8,962	131	3,000
*Refugio (old, New, & Fox)	1,461	79,448	70,552	209	7,500
Roche	1,206	8,882	26,118	48	1,900
Swan Lake	422	6,282	13,718	38	1,500
*Tom O'Connor	5,106	238,204	211,796	656	7,000
*West Ranch	3,731	112,928	137,072	659	10,800
RAILROAD DISTRICT 3:					
Amelia	576	26,628	8,372	116	1,200
*Anahuac	3,301	145,919	120,081	324	6,700
*Barber's Hill	1,711	108,089	21,911	152	1,700
Bay City	481	23,178	6,822	53	1,000
Bender	486	4,090	10,910	71	2,800
Big Hill	478	4,407	10,593	61	1,000
Boling & South	1,457	32,844	47,156	198	5,200
Chenango	415	2,346	12,654	48	1,800
*Chocolate Bayou	1,008	64,058	42,942	70	3,300
*Conroe & West	5,998	374,544	225,456	829	11,600
Danbury	622	10,608	19,392	72	1,500
Fannett	819	31,357	18,643	81	1,800
Fig Ridge	592	20,337	19,663	73	1,500
Franks	547	1,972	9,028	32	1,000
Gillock & E. & S.	2,601	39,409	50,591	182	2,000
*Goose Creek & East	2,751	101,992	48,008	327	4,000
Hankamer & South	790	16,188	23,812	106	2,000
*Hastings	5,712	291,195	208,805	632	5,300
*High Island	3,992	53,481	46,519	160	4,500
Houston, So.	1,080	29,928	23,072	80	1,300
*Hull-Merchant	4,708	146,682	100,318	485	18,000
*Humble	1,284	135,457	29,543	370	3,000
*Katy, North	503	115,045	84,955	102	3,000

Field	1958 prod.	Cum. prod.	Est. res.	No. wells	Prod. acres
TEXAS (Continued)					
*Liberty, So.	5,592	44,396	95,604	382	7,000
Livingston	628	26,587	8,413	127	2,300
*Magnet Withers & East & West	880	38,560	66,440	241	15,500
Manvel	820	58,151	26,848	150	2,500
Markham-Bay City	1,762	28,720	19,280	240	4,600
*Old Ocean	4,628	110,653	86,347	181	2,300
Orange	1,355	44,498	20,502	246	2,500
*Pierce Junction	5,310	77,233	122,767	343	3,600
Raccoon Bend	1,100	61,983	35,017	207	3,700
Red Fish Reef	823	11,786	38,214	59	2,400
Rose City	399	5,255	4,745	24	1,000
Saratoga & West	1,599	44,461	25,539	390	20,000
Sheridan	2,110	25,797	36,203	39	1,000
Silsbee (all fields)	1,333	29,776	20,224	80	1,500
*Sour Lake	1,297	100,442	24,558	304	13,000
*Spindletop	619	135,305	14,695	132	1,000
Stowell	939	46,443	23,557	74	4,100
Sugar Valley	519	17,306	12,694	101	1,400
Sugarland	504	54,176	10,824	47	1,000
*Thompson (all fields)	8,544	229,967	115,033	344	5,600
Tomball	1,344	60,803	21,197	398	6,500
Trinity Bay & West	614	4,096	15,094	52	1,500
Village Mills & East	1,683	24,086	25,914	178	1,800
*Webster	4,915	237,079	212,921	206	2,600
*West Columbia & New Withers, North	2,783	128,260	31,740	221	6,600
	875	33,775	26,225	147	5,000
RAILROAD DISTRICT 5:					
Corsicana	1,286	21,935	9,065	1,587	10,000
Ham Gossett (all fields)	442	6,797	8,203	71	3,000
*Powell	284	126,622	3,378	105	2,500
*Van	4,702	277,878	127,122	653	5,900
RAILROAD DISTRICT 6:					
Bethany	597	1,785	13,215	96	33,400
Carthage	1,014	26,295	18,705	120	38,500
*East Texas	46,195	3,352,174	1,758,826	9,716	135,700
Good Omen	599	2,133	7,867	63	3,400
*Hawkins	8,782	235,663	289,337	599	12,500
Haynes	1,584	4,438	20,562	137	5,200
Kildare	1,488	5,571	19,429	111	4,200
Long Lake & East	549	29,140	10,860	119	12,500
*Neches	1,925	12,099	172,901	255	6,500
New Hope	2,450	28,912	24,088	72	2,000
Quitman	1,776	38,527	21,473	227	5,500
Rodessa		(See North Louisiana)			
Slocum	1,520	3,205	31,795	147	3,000
*Talco	2,888	163,487	66,513	642	9,000
Waskom	793	9,972	25,028	148	6,000
NORTH AND WEST CENTRAL TEXAS					
RAILROAD DISTRICT 7-B:					
Coleman County:					
Glen Cove (all fields)	430	5,426	4,574	87	1,800
Fisher County:					
Claytonville	624	5,797	14,203	55	1,700
Eskota	459	3,671	6,329	110	1,500
Pardue	461	7,749	7,251	75	1,900
Round Top	885	16,818	13,182	191	3,500
Jones County:					
Hamlin and East and North	451	5,501	9,499	88	1,500
Nolan County:					
Dora, North	822	4,575	20,425	85	2,000
Hylton, Northwest	730	5,578	19,422	82	3,000
Nena Lucia	1,618	4,386	35,614	214	8,000
White Flat	569	5,730	14,270	67	2,100
Stonewall County:					
Boyd	643	6,417	28,583	62	2,500
Flowers (Canyon	962	9,652	15,348	221	8,600
Katz	1,895	15,772	34,228	166	8,000
Old Glory	458	6,979	18,021	98	3,800
RAILROAD DISTRICT 9:					
Archer County:					
Hull-Silk-Sikes	1,436	53,219	26,781	413	9,000
Clay County:					
Joy	1,000	13,084	21,916	250	5,000
Cooke County:					
Sivells Bend	679	13,041	11,959	82	2,600

Field	1958 prod.	Cum. prod.	Est. res.	No. wells	Prod. acres
TEXAS (Continued)					
Walnut Bend	1,596	47,898	42,102	366	7,000
Grayson County:					
Big Mineral Creek	1,103	9,030	25,970	143	1,500
Sadler, West	425	3,192	6,808	74	400
Sandusky	437	5,250	4,750	77	1,000
Sherman (all fields)	1,872	20,487	49,513	331	3,500
Knox County:					
Knox City, North	404	5,265	4,735	57	800
Voss	379	773	9,227	115	1,500
Wichita County:					
*Burkburnett	2,167	188,759	65,241	1,350	8,000
*Electra	2,166	182,402	33,598	2,826	14,000
*K.M.A.	4,473	116,776	68,224	1,671	31,000
Wise County:					
Alvord	622	1,823	8,177	97	2,000
Boonsville	454	1,082	8,918	46	800
Chico, West	449	3,649	11,351	114	2,200
Young County:					
Langston-Kleiner	429	5,199	9,801	210	3,000
TEXAS PANHANDLE					
RAILROAD DISTRICT 10:					
*Badger	3,573	92,811	30,189	1,294	49,000
*Borger-Pantex	3,391	138,849	46,151	1,065	40,000
Farnsworth	764	1,983	13,017	55	3,400
*Finley	3,374	120,054	58,946	730	28,000
Quinduno	1,042	7,407	20,593	172	5,500
Twin	464	1,075	13,925	59	6,500
Waka, W. Morrow	532	1,095	13,905	40	3,000
*West Pampa	3,609	126,596	33,404	1,198	48,000
WEST TEXAS					
RAILROAD DISTRICT 7-C:					
Amacker-Tippett	711	4,163	15,837	36	2,000
Benedum-Spraberry	709	25,298	34,702	164	15,000
*Big Lake	659	116,504	5,496	157	6,000
Bronte	524	6,510	8,490	98	1,900
Cree Sykes	588	12,200	17,800	122	3,600
Farmer, San Andrews	420	2,296	7,704	143	5,800
Fort Chadbourne	3,964	30,882	29,118	153	15,000
Hulldale, Penn	540	10,935	29,065	123	4,300
*Jameson	2,727	39,936	60,064	631	17,000
King Mountain	556	1,974	8,026	21	600
*McCamey	2,054	102,626	37,374	893	20,500
Neva West	433	4,180	10,820	30	700
Olson	522	4,727	13,273	134	5,200
*Pegasus	3,159	39,779	97,221	304	4,600
*Spraberry Trend Area	11,150	162,022	188,978	2,700	109,000
Todd	1,116	40,168	29,832	98	2,000
Wilshire	1,147	20,656	39,344	46	3,300
World	1,052	25,087	22,913	167	9,200
World, West	621	2,663	12,337	43	1,500
RAILROAD DISTRICT 8:					
Adair	1,207	20,548	19,452	170	4,500
Amrow	580	3,740	12,260	21	840
*Andector	2,844	57,493	52,507	136	5,000
Andrews	1,623	8,223	41,777	147	3,200
Andrews, South	1,007	2,739	17,261	90	1,600
Anton-Irish	1,610	26,471	21,529	190	7,400
Arthur (Spraberry)	1,087	2,972	12,028	84	6,500
Bakke (all fields)	1,660	3,081	26,919	88	3,000
Block 11	489	4,617	10,383	47	1,800
Block 12, East	614	3,220	11,780	32	1,300
*Block 31	5,716	48,434	71,566	89	6,000
Brahaney	1,032	4,104	25,896	194	7,000
Buckshot	528	897	11,103	89	1,700
C-Bar	703	4,098	15,902	143	5,600
Cedar Lake	871	24,697	20,303	178	7,500
*Cogdell	3,919	57,449	77,551	425	15,000
*Cowden, North	4,948	136,146	83,854	892	29,000
*Cowden, So. and (Johnson & Foster)	6,058	155,037	144,963	1,333	54,600
Deep Rock	746	6,921	21,079	46	2,500
*Diamond-M	5,220	82,883	112,117	624	19,000
*Dollarhide	2,989	63,288	76,712	316	4,800
Dora Roberts	1,888	8,565	41,435	83	3,000
Dorward	634	4,271	10,729	214	6,200
Dune	2,447	10,663	19,337	459	11,500
Edwards	458	2,575	12,425	105	3,100
Embar	1,319	21,430	28,570	161	5,200

Field	1958 prod.	Cum. prod.	Est. res.	No. wells	Prod. acres
TEXAS (Continued)					
*Emma and (Triple "N")	3,934	27,774	72,226	224	4,400
Emperor	1,495	15,716	24,284	293	5,000
Fasken	415	1,328	8,672	31	600
Flanagan	821	5,176	14,824	106	3,200
Fluvanna	1,015	5,489	29,511	95	3,800
Ft. Stockton	896	10,617	21,383	317	12,500
Fuhrman-Mascho	3,470	33,863	46,137	674	17,000
*Fullerton & N. & S.	4,821	128,023	121,977	831	26,000
Garza	1,758	34,046	35,954	521	9,000
Glasco (Dev.)	562	3,014	11,986	23	1,000
*Goldsmith	8,615	248,321	201,679	1,722	35,000
Good	671	12,801	12,199	48	2,000
Halley	676	5,227	9,773	134	2,800
Harper	1,787	20,001	33,999	474	8,700
*Headlee	2,635	16,425	83,575	126	2,300
*Hendricks	1,966	230,648	21,352	317	10,500
*Howard-Glasscock	5,901	198,690	88,310	1,567	20,000
Iatan, E. Howard	1,570	35,183	15,817	653	10,500
Jo-Mill	2,891	10,850	65,150	204	7,500
*Jordan	2,498	54,677	45,323	394	5,500
*Kelly-Snyder	16,339	209,070	530,930	1,436	52,000
*Kermit	4,892	59,575	60,425	883	17,000
*Keystone	4,894	157,812	145,188	931	11,500
Lea	815	5,915	19,085	79	2,000
*Levelland	5,402	108,590	141,410	2,016	84,000
Luther, S. E. (Dev.)	624	4,085	10,915	34	1,400
Mabee	873	14,889	30,111	182	6,000
Magutex	1,524	9,597	40,403	96	2,100
Marton	1,290	27,206	32,794	171	2,500
*McElroy	7,610	165,461	184,539	1,514	32,000
McFarland	2,332	8,747	51,253	309	11,500
*Means	4,250	42,766	87,234	682	28,000
*Midland Farms	4,435	56,092	53,908	418	18,000
Monahans, North	675	1,547	8,453	125	320
Moore	661	4,355	5,645	246	10,100
Nolley	693	5,628	14,372	78	1,800
Aceanic	600	5,259	14,741	47	1,900
Pecos Valley (all fields)	1,578	13,257	21,743	687	17,300
Penwell	1,833	44,159	20,841	323	9,600
*Prentice	3,629	28,498	81,502	427	7,500
Reinecke	828	16,940	20,060	70	2,800
Revilo (Glorieta)	949	2,510	32,490	226	8,000
Riley, North	548	6,677	8,323	72	2,800
Robertson	1,199	9,350	25,650	207	3,100
Robertson, No.	678	1,260	16,740	58	1,700
Running W	1,260	2,247	27,753	129	4,900
*Russell & North	4,325	35,061	94,939	307	6,000
S-M-S	648	4,075	10,925	79	3,200
Salt Creek	2,199	26,452	53,548	110	8,400
*Sand Hills	4,422	33,678	96,322	868	15,000
Scarbrough	1,124	9,805	25,195	185	7,300
*Seminole	2,442	95,800	84,200	361	13,000
Seminole, West	774	9,402	10,598	82	3,000
Shafter Lake	2,045	46,742	48,258	500	8,500
Sharon Ridge	2,174	20,817	58,183	1,305	14,000
Shipley	845	11,228	18,772	240	8,600
*Slaughter	7,100	250,751	190,249	2,532	106,300
Snyder	984	13,308	27,692	63	11,500
Spraberry and Deep	473	5,819		71	1,600
Spraberry West	654	3,604	11,396	55	1,000
Spraberry Trend Area		(See District 7-C)			
*TXL	4,547	140,831	133,169	495	7,100
Three Bar (Dev.)	626	13,727	13,273	63	3,500
Twofreds	510	696	9,304	66	2,500
University, Block 9	2,252	10,464	54,536	133	4,500
University (Waddell)	588	9,066	15,934	54	1,000
Varel	571	2,053	12,947	137	4,400
Vealmoor	794	14,439	50,561	77	3,200
Vealmoor, East	927	16,567	48,433	87	3,600
Virey	1,411	8,724	46,276	70	3,000
Waddell	1,786	25,338	34,662	333	12,500
War-San	924	4,696	25,304	37	1,500
*Ward, South	3,333	71,822	53,178	1,055	35,600
*Ward-Estes North	11,196	83,172	59,828	1,677	14,800
*Wasson (66 and 72)	9,496	328,499	321,501	1,912	71,000
Welch	1,346	27,641	32,359	372	13,800
Wellman	546	9,557	10,443	30	1,200
Westbrook	1,355	22,122	36,878	433	12,000
Yarbrough & Allen	1,151	18,699	21,301	76	3,200
*Yates	5,427	455,015	194,985	666	12,600

★ SUPPLY-DEMAND



Demand will hit 9.46 million barrels

DOMESTIC DEMAND for petroleum products will show a larger increase in 1959 than the average annual gain since the end of World War II.

The total for the year is expected to be about 9,461,000 bbl. daily for a gain of 425,000 bbl. daily over 1958. The chart shows percentage gains by years since the end of the war. These changes tend to form a saw-tooth pattern until the last 2 years. There was a peak in 1947, followed by a decline to 1949. The second peak in 1950 was the starting point for a 4-year decline. This was followed by another 3-year cycle, ending with 1957.

There was no sharp return to a peak gain in 1958, and the outlook for 1959 indicates a gradual return to near-normal gains rather than a sudden jump.

Part of the gain in 1959 will be due to the low demand in 1958 which was the base for the increase. The 1957-58 period was the only 2-year period since the end of the war having gains for both years under 3%. This gives a low base from which to measure the increase for 1959.

Average gasoline demand for the year will top 4,000,000 bbl. daily for the first time. The percentage gain by distillate is expected to be in line with the gain for total products. The average for the year will be about 1,880,000 bbl. daily.

The percentage gain for residual fuel will be larger than that for distillate because the increase will be calculated from a very low average in 1958. The forecast for 1959 is slightly less than the total reported for 1957.

The top percentage gain for the year should go to asphalt and road oil. The forecast of 310,000 bbl. daily is based on some acceleration in the highway program.

Exports of crude and products will stay on the downward trend in 1959. The decrease will average about 8.7%, but the base total is so low that the loss will amount to only about 24,000 bbl. daily.

This reduction in exports will cut the over-all gain in total demand to 4.3%, but this looks good compared with the 0.8% decrease for 1958.

Sharp stock reductions at the end of 1958 removed most of the inventory surplus that had plagued suppliers for the past 2 years. Net withdrawals for the year averaged about 155,000 bbl. daily, the largest stock decrease since the wartime reduction in 1942. This big stock cut in 1958 made room for a small increase in product stocks in 1959. The gain for the year probably will average about 25,000 bbl. daily. However, the amount of the stock change will be determined by new supply for the year.

Imports will be under some type of regulation in 1959, but the program had not been worked out at the time this forecast was prepared. The figure of 1,660,000 bbl. daily, shown in the table, is not a recommendation. It represents a rounding of the average for 1958. If imports are held at a lower level, domestic production will be increased to make up the difference.

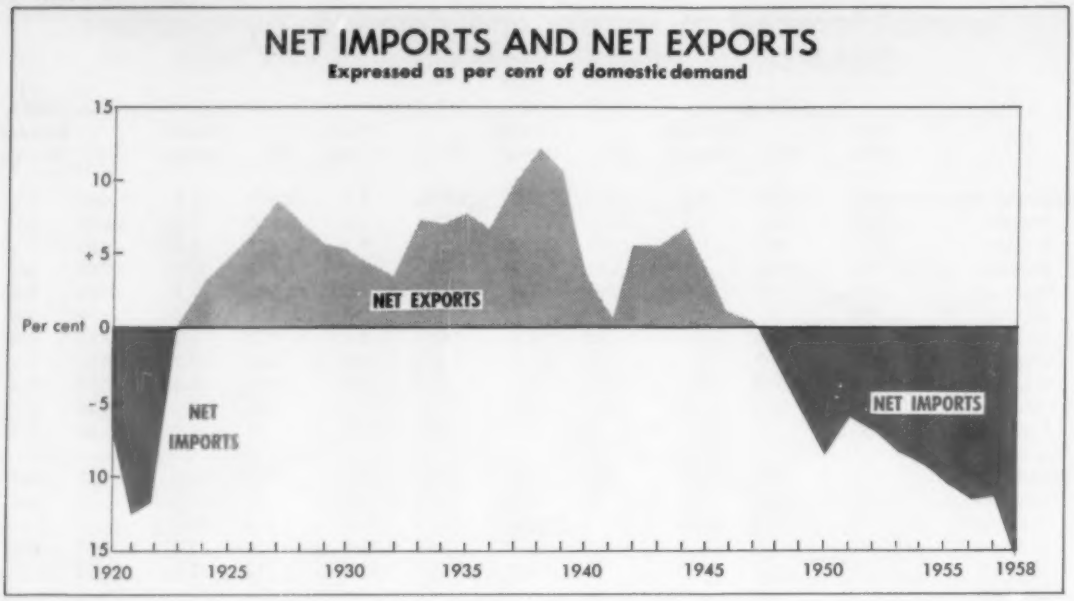
If imports for the year average about the same as in 1958, domestic crude production will move up almost 8% from the very low average last year. Production for 1958 averaged about 6,706,000 bbl. daily, the lowest since 1954. The total for 1959 will be about 7,235,000 bbl. daily.

Journal forecast of supply and demand, by quarters

(Thousands of barrels daily)

	Year 1958	1st quarter Vol.	1st quarter Per cent change	2nd quarter Vol.	2nd quarter Per cent change	3rd quarter Vol.	3rd quarter Per cent change	4th quarter Vol.	4th quarter Per cent change	Year 1959 Vol.	Year 1959 Per cent change
Domestic demand	**9,036**	**10,135**	**4.6**	**8,849**	**6.8**	**8,856**	**4.3**	**10,012**	**3.3**	**9,461**	**4.7**
Gasoline	3,887	3,655	5.5	4,235	4.4	4,260	2.8	3,965	2.2	4,030	3.7
Kerosine	313	487	–2.6	183	12.9	200	9.3	432	5.4	325	3.8
Distillate	1,795	2,655	4.8	1,350	6.2	1,240	6.8	2,286	2.8	1,880	4.7
Residual	1,422	1,755	3.2	1,395	14.0	1,260	1.5	1,595	4.6	1,500	5.5
Jet fuel	258	267	14.6	277	3.0	277	5.3	266	0.4	272	5.4
Lubricants	105	108	9.1	118	8.3	117	5.4	108	4.9	113	7.6
LP-gas	485	607	2.5	416	10.3	454	11.8	624	10.2	525	8.2
Asphalt & rd. oil	276	122	18.4	356	12.7	515	13.2	244	8.4	310	12.3
Other products	430	419	4.0	459	2.9	473	5.6	432	2.6	446	3.7
Crude loss	65	60	....	60	5.3	60	–20.0	60	–14.3	60	–7.7
Exports	**277**	**248**	**–5.7**	**264**	**–0.8**	**254**	**–16.4**	**247**	**–10.5**	**253**	**–8.7**
Gasoline	75	64	–3.0	70	–5.4	75	8.5	67	–11.8	69	–8.0
Kerosine	3	5	67.0	5	150.0	3	50.0	3	–25.0	4	25.0
Distillate	52	48	–21.3	55	25.0	46	–23.3	50	13.6	50	–3.8
Residual	71	64	10.3	65	–5.8	61	–27.4	58	–22.7	62	–12.7
Jet fuel	....	....	....	....	....	....	....	....	....	....	....
Lubricants	36	31	....	33	–8.3	32	–17.9	32	–13.5	32	–11.1
LP-gas	8	11	....	8	14.3	8	14.3	9	....	9	12.5
Asphalt & rd. oil	4	3	....	3	....	4	–20.0	3	–40.0	3	–25.0
Other products	15	13	–7.1	15	–6.3	16	6.7	16	....	15	....
Crude loss	13	9	–43.8	10	–33.3	9	....	9	–10.0	9	–30.8
Total demand	**9,313**	**10,383**	**4.3**	**9,113**	**6.5**	**9,110**	**3.6**	**10,259**	**3.0**	**9,714**	**4.3**
Gasoline	3,962	3,719	5.4	4,305	4.2	4,335	2.6	4,032	1.9	4,099	3.4
Kerosine	316	492	–2.2	188	14.6	203	9.7	435	5.1	329	4.1
Distillate	1,847	2,703	4.2	1,405	6.8	1,286	5.3	2,336	3.0	1,930	4.5
Residual	1,493	1,819	3.4	1,460	12.9	1,321	–0.3	1,653	3.3	1,562	4.6
Jet fuel	258	267	14.6	277	3.0	277	4.9	266	0.4	272	5.4
Lubricants	141	139	6.9	151	4.1	149	–0.7	140	....	145	2.8
LP-gas	493	618	2.5	424	10.4	462	11.9	633	10.1	534	8.3
Asphalt & rd. oil	280	125	17.9	359	12.5	519	12.8	247	7.4	313	11.8
Other products	445	432	3.6	474	2.6	489	5.6	448	2.5	461	3.6
Crude	78	69	–9.2	70	–2.8	69	–17.9	69	–13.8	69	–11.5
Stock change	**–155**	**–620**	....	**500**	....	**530**	....	**–320**	....	**25**	....
Crude	–57	–80	....	70	....	30	....	–20	....	....	....
Products	–98	–540	....	430	....	500	....	–300	....	25	....
New supply	**9,158**	**9,763**	**6.9**	**9,613**	**11.3**	**9,640**	**4.1**	**9,939**	**3.5**	**9,739**	**6.3**
Imports	**1,654**	**1,791**	**6.6**	**1,608**	**0.9**	**1,504**	**–6.4**	**1,739**	**0.2**	**1,660**	**0.4**
Crude	947	950	–0.9	950	3.4	950	0.7	950	–1.9	951	0.3
Products	707	841	16.6	658	–2.5	554	–16.6	789	2.7	710	0.4
Production	**7,504**	**7,972**	**7.0**	**8,005**	**13.7**	**8,136**	**6.3**	**8,200**	**4.2**	**8,079**	**7.7**
Crude	6,706	7,112	7.0	7,181	14.2	7,313	6.5	7,330	4.4	7,235	7.9
Natural, etc.	798	860	6.6	824	9.4	823	4.6	870	3.0	844	5.8
Runs to stills	**7,597**	**8,028**	**6.8**	**7,951**	**7.8**	**8,129**	**5.4**	**8,196**	**5.4**	**8,077**	**6.3**
Crude transfers	**36**	**45**	**–2.2**	**40**	**25.0**	**35**	....	**35**	**12.9**	**39**	**8.3**
Total stocks*	**784**	**728**	....	**773**	....	**822**	....	**793**	....	**793**	....
Gasoline	187	207	....	185	....	172	....	189	....	189	....
Kerosine	26	17	....	26	....	33	....	27	....	27	....
Distillate	127	76	....	107	....	159	....	130	....	130	....
Residual	61	51	....	55	....	60	....	61	....	61	....
Other products	122	123	....	140	....	135	....	125	....	125	....
Crude	261	254	....	260	....	263	....	261	....	261	....

*Stocks in millions of barrels at end of period.



Imports rose to all-time high in '58

IT WAS THE YEAR when imports were supposed to be brought under control, but 1958 saw total imports of petroleum and its products increase by 79,000 bbl. per day, or 5.0%, to the all-time high of 1,654,000 bbl. per day.

There were some controls put on crude-oil imports, and they had a significant effect. Crude imports dropped by 76,000 bbl. per day, or 7.4%—averaging 947,000 bbl. per day in 1958 compared with 1,023,000 bbl. per day in 1957.

But this simply invited bigger imports of refined products. Products imports, which had been 552,000 bbl. per day in 1957, jumped to 707,000 bbl. per day in 1958—an increase of 155,000 bbl. per day, or 28.1%. Much of this was in the form of so-called unfinished products requiring some further processing and thus classed as crude for tariff purposes but as products in the industry's statistics.

This jump in total imports, coming in a year of disappointing demand and the lowest exports in recent times, brought net imports to 15.3% of domestic demand. This compares with 11.4% in 1957, 11.5% in 1956, and much lower ratios in prior years as shown in the chart at the top of this page.

Considering imports alone, rather than as a "net" figure after subtraction of exports, 1958 imports of crude and products represented 18.3% of domestic demand and 17.8% of total U. S. demand.

Expressed another way, total imports were 24.7% of U. S. crude production in 1958, compared with the 1954 ratio of 16.6% which the President's cabinet committee once termed "desirable."

Still another comparison: U. S. 1958 imports were 18.8% of the production of all foreign countries exclusive of those in the Communist bloc.

Until this year when restrictions on crude imports began to be effective, imports of petroleum products consisted largely of residual fuel oil. In 1957 imports of resid averaged 475,000 bbl. per day, and in 1958 they averaged 477,000 bbl. per day.

But imports of unfinished products jumped from 3,000 bbl. per day in 1957 to 91,000 bbl. per day in 1958, and imports of other finished products jumped from 70,000 bbl. per day in 1957 to 142,000 bbl. per day in 1958.

During the past half-dozen years, imports of finished and unfinished products have ranged fairly close to an average of 5% of total U. S. demand for all oils. But in 1958 these imported products supplied 7.6% of total U. S. demand.

Furthermore, the imports of unfinished products added insult to injury by fouling up refining statistics. Because many seaboard refineries substituted unfinished products for a comparable volume of crude as charging stock, their yield of gasoline was boosted to unprecedented and deceptively high percentages.

The exporting nations that bore the brunt of the curtailment of crude imports can be identified from the table at top of next page. It clearly shows that our nearest sources of foreign supply suffered by far the most. Venezuela's shipments were cut 103,000 bbl. per day, and Canada's by 71,000.

But imports from the Middle East continued to rise. True, Iran and the Neutral Zone suffered sharp percentage curtailments, but other exporters in the region increased their shipments here so that total imports from the Middle East were running 329,600

Source of U. S. imports*

FIRST 10 MONTHS

(Thousands of barrels daily)

	1958	1957	Change Volume	Change Per cent
Mexico	1.8	7.3	— 5.5	— 75.3
Colombia	24.1	22.0	2.1	9.5
Venezuela	431.3	534.9	—103.6	— 19.4
Peru	0.6		0.6	
Ecuador		2.7	— 2.7	—100.0
Trinidad	0.4	1.3	— 0.9	— 69.2
Kuwait	178.2	128.4	49.8	38.8
Saudi Arabia	105.8	49.8	56.0	112.4
Neutral Zone	1.3	9.8	— 8.5	— 86.7
Iraq	24.8	9.3	15.5	166.7
Iran	15.2	19.7	— 4.5	— 22.8
Qatar	4.3	4.1	0.2	4.9
Canada	86.1	157.4	— 71.3	— 45.3
Far East	64.5	56.9	7.6	13.4
Brazil	0.9		0.9	
Total	939.3	1,003.6	— 64.3	— 6.4

*Bureau of Mines.

. . . and import-export record

(Thousands of barrels daily)

	Imports Crude	Imports Products	Imports Total	Exports Crude	Exports Products	Exports Total
1941	139	127	266	91	207	298
1942	34	64	98	93	227	320
1943	38	136	174	113	298	411
1944	122	130	252	93	474	567
1945	203	108	311	90	411	501
1946	236	141	377	116	303	419
1947	267	170	437	127	324	451
1948	353	161	514	109	259	368
1949	421	224	645	91	236	327
1950	487	363	850	95	210	305
1951	490	354	844	78	344	422
1952	573	379	952	73	359	432
1953	648	386	1,034	55	347	402
1954	656	396	1,052	37	318	355
1955	782	466	1,248	32	336	368
1956	934	502	1,436	78	352	430
1957	1,023	552	1,575	138	430	568
1958—						
1st qr.	959	721	1,680	16	247	263
2nd qr.	919	675	1,594	15	251	266
3rd qr.	943	664	1,607	9	295	304
*4th qr.	968	768	1,736	10	266	276
Year	947	707	1,654	12	265	277
1959†	**950**	**710**	**1,660**	**9**	**244**	**253**

*Estimated. †Forecast.

bbl. per day. This was an increase of 108,500 bbl. per day, or 49.1%, over 1957 Middle East imports.

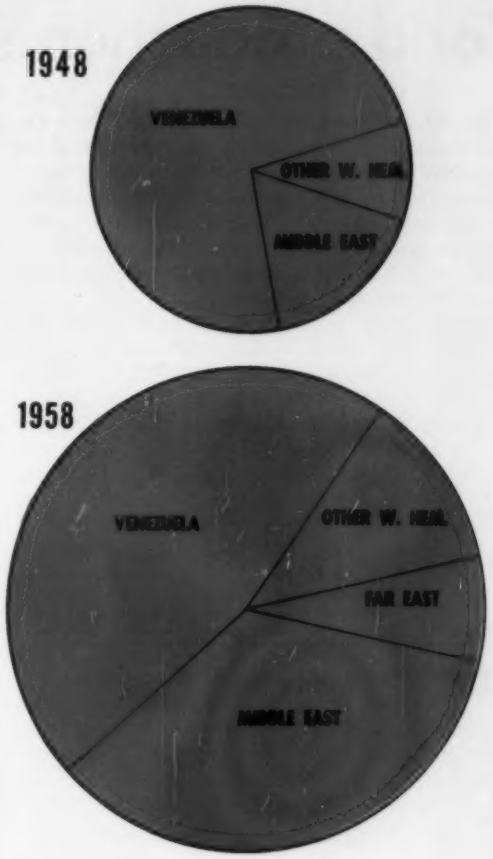
Imports from the Far East (mostly Sumatra) also increased notably. Some of the smaller exporting areas showed rather wide percentage changes, but the total volume of oil involved was comparatively small.

As for U. S. exports, the postwar story is told in the table headed Import-Export Record. When the Suez crisis ended in mid-1957 our exports took a nosedive. Last year's total exports of 277,000 bbl. per day were a little less than half the total for 1957.

The Government's program for voluntary restrictions on crude imports was under fire throughout the year. A number of importers exceeded their allotments, dozens of new ones applied for quotas, one or two began importing without even asking for allotments, and products began coming in as substitute for crude.

SOURCES OF IMPORTED CRUDE

As per cent of total



There was long debate in Congress, but all bills embodying specific restrictions were defeated. Instead, Congress extended the life of the Reciprocal Trade Act with a revised defense amendment using general terms but clearly directing the administration to hold down imports of both crude and products.

Both before and after this enactment, the administration made a series of changes in its program, designed to increase its effectiveness but still maintain the facade of a voluntary plan. The industry was asked for suggestions on how the new law might be administered, and dozens of proposals were submitted.

But nothing seemed satisfactory, and the year ended with the cabinet committee still mulling over possible new approaches to the problem.

There was general expectation that, whatever the machinery employed, imports of crude and products during 1959 would somehow be held fairly close to their 1958 levels. That is the basis for The Oil and Gas Journal forecast in the import-export record table above. The 1959 figures for imports and exports are not a recommendation nor an opinion as to what is desirable—simply an attempt to be realistic.

World production shows slight gain

FREE-WORLD crude production rose last year, but the gain was small in comparison with the annual increases earlier in the 1950's.

Most of the rise was accounted for by the Middle East, where output surged 19.5%. The region produced more than 4 million barrels daily throughout the year, and the 4½-million mark was probably passed as the year drew to a close.

All-time records were set by all four major producers, Iran, Iraq, Saudi Arabia, and Kuwait. Saudi Arabia appeared likely to average more than 1 million barrels daily for the first year in history. Kuwait passed a milestone by producing more than 1½ million barrels daily on a monthly basis toward the year's end.

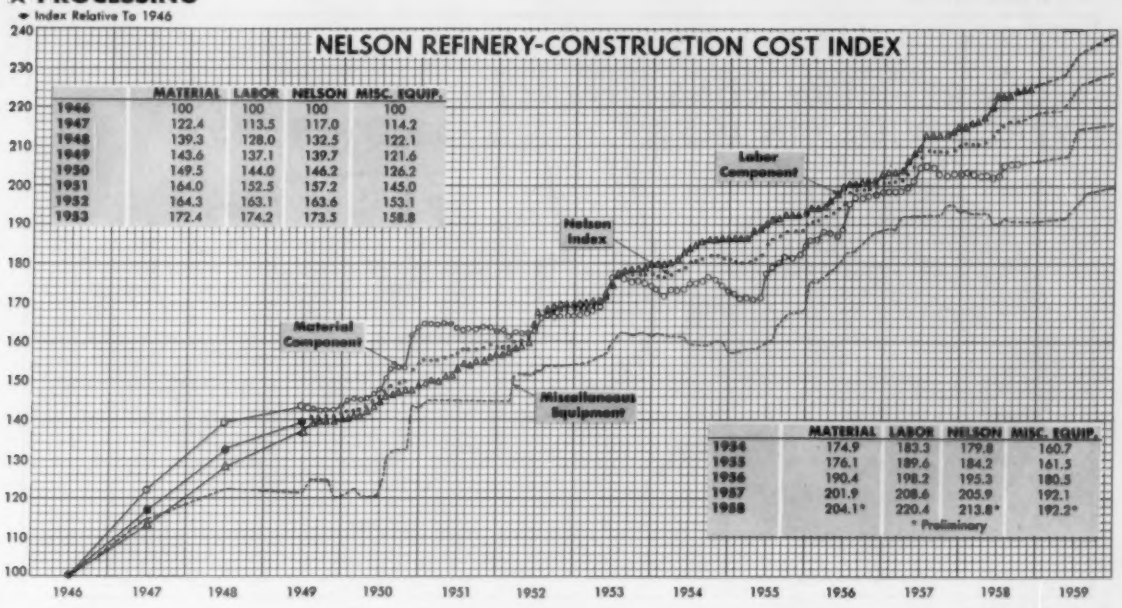
The picture was darker in the Western Hemisphere. United States operators produced about 6.5% less oil than a year earlier, and output in Venezuela was down in the same proportion. Canadian producers were down about 9.5%.

Three new areas joined the list of producing regions during the year, all of them in Africa. Commercial production on a test basis began in Nigeria. Angola started receiving limited supplies from its own fields. Production also got under way in the French Sahara. Output from small fields in the northern part of Algeria was virtually shut down in spring.

Four Middle East countries (★) set all-time records

Country—	Production (thou. of bbl.) 1958	1957	Per cent change	Est. crude-oil reserves (millions of bbl.)	Ref. capacity (thou. of BPSD)
Western Hemisphere:					
Argentina	94.0	93.1	1.0	1,000.0	221.5
Bolivia	9.4	9.0	4.4	90.0	12.3
Brazil	51.0	27.7	84.0	250.0	152.8
Canada	451.0	498.2	—9.5	4,000.0	872.0
Chile	15.3	11.9	28.6	50.0	24.0
Colombia	126.0	124.5	1.2	700.0	73.4
Cuba	1.0	1.1	—9.1	3.0	88.4
Ecuador	8.8	8.7	1.1	25.0	5.8
Mexico	260.0	241.8	7.5	2,500.0	447.0
N.W.I.					650.0
Peru	53.0	52.7	0.6	325.0	49.2
Puerto Rico					77.5
Trinidad	102.0	93.3	9.3	400.0	158.5
Uruguay					28.0
Venezuela	2,600.0	2,779.2	—6.4	16,500.0	820.1
Total	**3,771.5**	**3,941.2**	**—4.3**	**25,843.0**	**3,680.5**
Middle East:					
Aden					120.0
Bahrain	40.6	32.0	26.9	230.0	186.5
Iran	825.0	725.0	13.8	33,000.0	493.0
★Iraq	721.0	446.9	61.3	25,000.0	55.8
★Israel	1.5	1.2	25.0	50.0	87.0
Kuwait	1,400.0	1,142.9	22.5	60,000.0	220.0
★Lebanon					24.0
Neutral Zone	78.0	76.6	1.8	6,000.0	50.0
Qatar	168.0	138.5	21.3	2,500.0	0.6
Saudi Arabia	1,013.0	992.1	2.1	47,000.0	189.0
★Southern Arabia				100.0	
Syria				1.0	
Total	**4,247.1**	**3,555.2**	**19.5**	**173,881.0**	**1,425.9**
Africa:					
Algeria (inc. Sahara)	9.2	0.3		2,970.0	3,500.0
Angola	2.0			25.0	2.2
Egypt	61.0	44.1	38.0	400.0	74.7
Gabon	9.3	3.8	144.7	100.0	
Libya				50.0	
Morocco	1.5	1.6	—6.2	8.5	2.1
Moyen Congo				10.0	
Nigeria	5.5			25.0	
South Africa					21.1
Total	**88.5**	**49.8**	**77.7**	**4,118.5**	**100.1**

Country—	Production (thou. of bbl.) 1958	1957	Per cent change	Est. crude-oil reserves (millions of bbl.)	Ref. capacity (thou. of BPSD)
Europe:					
Austria	53.0	60.1	—11.8	300.0	49.3
Belgium					175.9
Denmark					0.6
Finland					23.0
France	27.5	27.5		175.0	713.2
Greece					30.0
West Germany	86.0	78.2	9.6	420.0	406.5
Italy (inc. Sicily)	29.0	25.5	13.7	300.0	722.9
Netherlands	30.0	29.1	3.1	200.0	349.0
Norway					2.0
Portugal					22.9
Spain					144.7
Sweden					47.8
Turkey	6.4	6.0	6.7	70.0	6.9
U.K.	1.7	1.7		7.0	917.9
Yugoslavia	9.0	7.6	18.4	35.0	27.5
Total	**242.6**	**235.7**	**2.9**	**1,507.0**	**3,640.1**
Asia-Pacific:					
Australia				1.0	212.2
British Borneo	106.0	117.1	—9.5	500.0	44.0
Burma	9.0	7.5	20.0	45.0	9.4
Formosa				0.5	28.0
India	8.8	8.8		500.0	110.0
Indonesia	320.0	313.9	1.9	8,500.0	248.8
Japan	7.0	6.2	12.9	50.0	553.2
New Guinea	5.0	6.2	—19.4	30.0	
Pakistan	5.9	5.9		20.0	6.0
Philippines					18.0
Total	**461.7**	**465.6**	**—0.8**	**9,646.5**	**1,229.6**
Total non-Communist countries less U. S.	**8,811.4**	**8,247.5**	**6.8**	**214,996**	**10,076.2**
United States	**6,706.0**	**7,170.0**	**—6.5**	**33,000.0**	**9,955.0**
Total free world	**15,517.4**	**15,417.5**	**0.6**	**247,996.0**	**20,031.2**
Russia and Red Bloc areas	**2,525.0**	**2,234.0**	**13.0**	**27,705.0**	
Total world	**18,042.4**	**17,651.5**	**2.2**	**275,701.0**	



Plant-building costs still soaring

THE SMALL RECESSION of 1957-58 failed to halt the cost of refinery construction. Wages continued to rise as if no slackening of business was possible and at present it appears that wages may increase during 1959 at even a faster than normal rate. Materials costs faltered for a few months but not to the extent of the declines of 1953 and 1955.

Although the chart on this page based on 1946 indicates an almost uniform increase in construction costs each year since 1948, if each year's cost is compared with that of the preceding year, the rate of increase has been gradually declining. Thus during 1948-1950 the rate of increase was about 9% per year whereas during 1955-1957 the rate of increase was less than 5% per year. Inflationary pressures appear to be abating although not to a degree that promises the halting of inflation.

The ability of industry to accommodate larger and larger wages without a corresponding increase in material costs is encouraging. Thus, materials costs have risen since 1948 by only 47%, while wages were advancing by more than 72%. Although a major purpose of society is the production of more goods for its labor, that is, ever-increasing wages, the present rate of wage increases has not been possible without cheapening of the dollar. Thus ever-increasing construction costs will prevail until society modifies its concept of wage increases or until some emergency forces a change in policy.

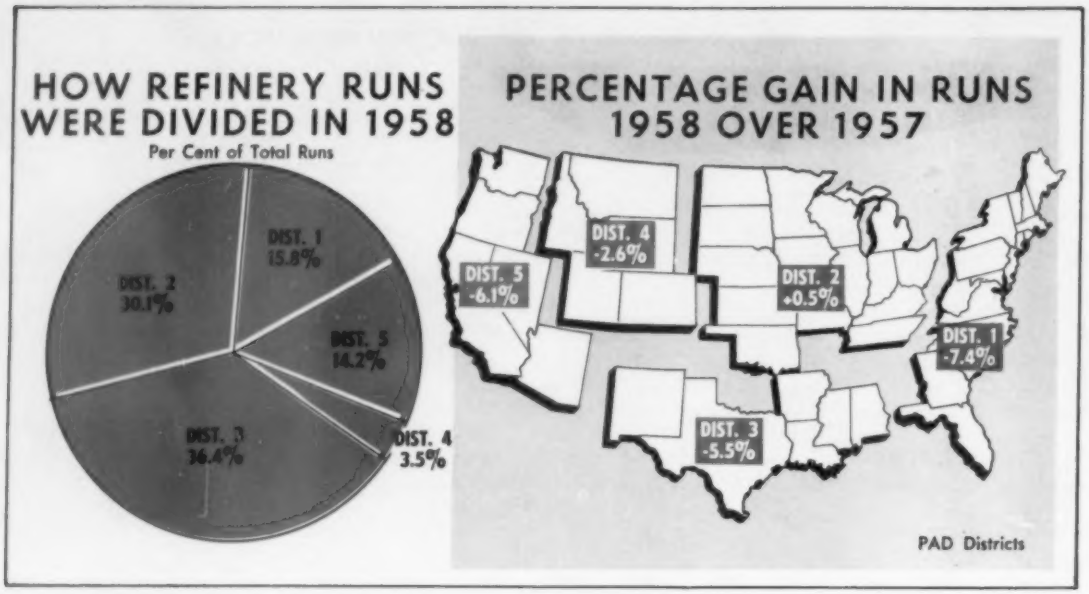
The Nelson Refinery Construction Cost Index is published in the first issue each month of The Oil and Gas Journal in the Engineering Section. It was described in the October 1, 1956, issue, page 110, and tabulated values of the index since 1946 were published in the issue of November 18, 1957, page 245.

In addition, the cost indexes of many different materials are published each quarter in the first issues of the months of January, April, July, and October. These items also indicate the relentless increases caused by inflation. The latest issue (January 5, 1959) shows the following increases above the issue of October 6, 1958: 36 items increased, 17 items unchanged, 12 items decreased.

Monthly values of the index components were published in the November 18, 1957, issue, pages 245 and 246. This is brought to date as follows:

	Materials Component	Labor Component	Misc. Equip. Average*	Nelson Index
January 1957	199.0	203.1	188.7	201.5
February	199.0	203.5	189.1	201.7
March	199.1	203.6	189.1	201.8
April	198.9	204.0	192.0	202.0
May	199.8	206.1	192.0	203.6
June	201.4	208.1	192.1	205.4
July	204.9	209.7	192.3	207.8
August	205.4	212.4	192.1	209.6
September	204.9	212.5	192.8	209.5
October	203.4	213.1	192.9	209.2
November	202.6	213.2	195.2	208.9
December	203.4	214.2	195.5	209.9
1957 Year	201.9	208.6	192.1	205.9
January 1958	203.3	215.5	193.8	210.6
February	203.9	215.6	193.9	210.9
March	203.2	216.1	193.0	210.9
April	202.5	216.6	193.2	211.0
May	202.5	217.9	193.3	211.7
June	202.0	220.4	190.6	213.0
July	202.2	222.6	190.6	214.4
August	205.2	223.0	191.4	215.9
September	205.8	223.6	191.0	216.5
October	205.8	224.1	191.2	216.8
November	206.6	224.4	192.7	217.3
December	†206.5	224.7	†192.0	†217.4
1958 Year	†204.1	220.4	†192.2	†213.8

*Used only in computing the materials component. †Preliminary.



Crude runs will top 8,000,000 bbl.

ONLY ONE major refining district reported a gain in crude runs for 1958. This was PAD District 2. However, the decreases in the other areas cannot be charged entirely to lack of demand for petroleum products.

The Suez crisis is still showing up when records for 1958 are compared with those for 1957. To meet European demands in the last quarter of 1956 and the first quarter of 1957, both refinery runs and crude production were pushed up in this country. The small chart on the opposite page shows crude input at refineries by months for 1957 and 1958. Runs for the first quarter of 1958 averaged 600,000 bbl. daily less than for the same period in 1957.

When the canal was opened exports dropped off and refining operations were cut back, but the lower operating level still was too high in light of reduced domestic demands. The result was a big gain in product stocks. These stocks had to be cut back in 1958. Complete reports for the first 10 months and major-product data for the other 2 months show that total product stock reduction for the year averaged between 90,000 and 100,000 bbl. daily or close to 35,000,000 bbl. for the year.

Since every barrel taken from product storage meant one less required for processing, the stock-reduction program cut refinery runs by at least 35,000,000 bbl. in 1958.

Again, the effect of Suez shows up in the list of percentage changes in runs by districts. Coastal areas had much larger losses than inland districts. Refineries in these areas made most of the products shipped during the period when the canal was closed.

But, Suez accounted for only part of the loss. These same coastal areas received most of the additional refined products imported in 1958. Imports of petroleum products averaged about 155,000 bbl. daily more in 1958 than in 1957. For the year, this represented a total of a little more than 56,000,000 bbl. All of the gain in product imports replaced crude input at refineries since most of the increases were in products lighter than residual.

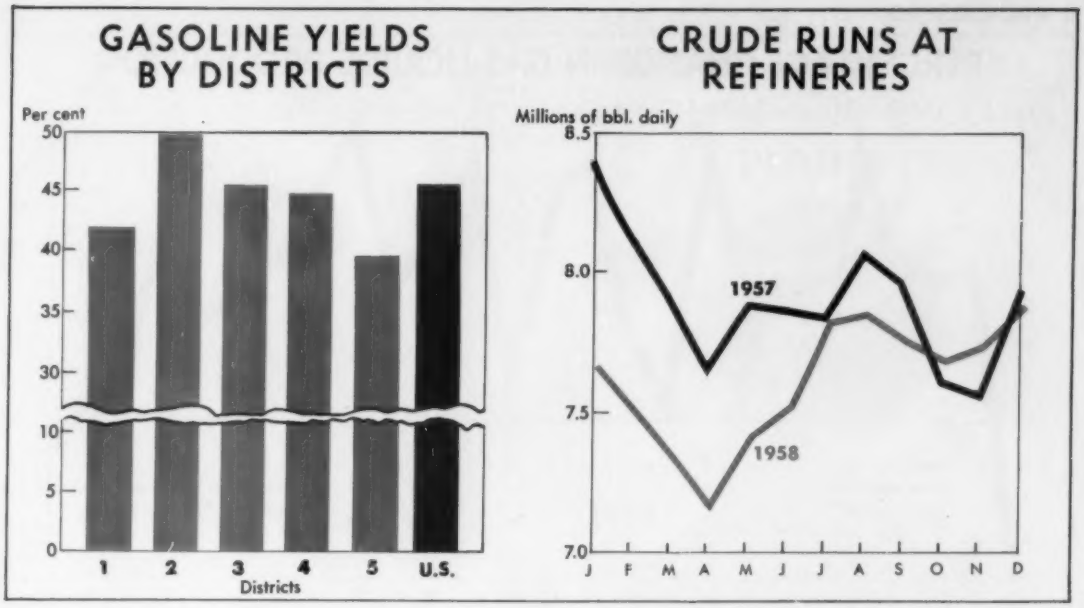
Imports Shift Yield Pattern

However, these imports did not displace equal volumes of downstream processing because part of product imports came in as unfinished oils requiring further processing. Detailed data on imports are not complete for the last 2 months of the year, but in the first 10 months, imports of unfinished oils topped the total for the same months of 1957 by 24,000,000 bbl. This means that 43% of the additional products imported in 1958 required some processing at refineries.

This same program of importing unfinished oils also accounted for part of the shift in product yields. The Bureau of Mines calculates percentage yields by dividing product output by total crude plus unfinished products rerun. In periods of little or no imports of unfinished oils, the method gives a good picture of how crude is broken down into products.

In past years, most imports of unfinished oils represented topped crude for asphalt with a portion of the total finding its way into the heavy-fuel group.

There was a definite change in 1958 from heavy to light. Imports of topped crude continued, but the big growth in imports of unfinished was in products



Refinery yield trends . . .

	Runs (thou. bbl. daily)	Yields (per cent) Gasoline	Kerosine	Distillate	Residual
1937	3,242	43.9	5.5	12.4	26.4
1938	3,192	44.3	5.5	13.0	25.3
1939	3,391	45.0	5.5	13.1	24.7
1940	3,536	43.1	5.7	14.2	24.4
1941	3,651	44.2	5.2	13.4	24.3
1942	3,655	39.8	5.1	14.7	26.9
1943	3,917	37.1	5.0	14.8	29.2
1944	4,551	39.4	4.7	14.4	27.7
1945	4,711	40.9	4.7	14.5	27.3
1946	4,740	39.6	6.0	16.6	24.9
1947	5,075	40.2	6.0	16.8	24.2
1948	5,549	40.3	6.0	18.7	22.9
1949	5,326	43.7	5.2	17.4	21.7
1950	5,739	43.0	5.6	19.0	20.2
1951	6,494	42.4	5.7	20.0	19.7
1952	6,670	43.0	5.4	21.3	18.6
1953	7,000	43.9	4.8	20.7	17.6
1954	6,958	43.8	4.8	21.3	16.4
1955	7,480	44.0	4.3	22.0	15.3
1956	7,937	43.4	4.2	22.9	14.7
1957	7,915	43.8	3.8	23.1	14.4
1958	7,597	45.4	3.9	22.6	12.9

closer to gasoline. The shift from heavy to light showed up as a jump in the percentage yield of gasoline.

The calculated yield of gasoline averaged 45.4% of total crude and unfinished oils processed during the year. This is an all-time record with the closest contender being the 45.0% reported for 1939. In recent years, the highest yield was in 1955 when the average was 44.0%.

Distillate yields dropped from 23.1% in 1957 to 22.6% in 1958. For the past 20 years, distillate demand has grown at a much faster rate than most other products. Yields climbed from 12.4% in 1937 to 23.1% in 1957. If distillate demand slows down to the normal oil-growth rate, distillate yields from a barrel of crude will level off at about the current percentage rate.

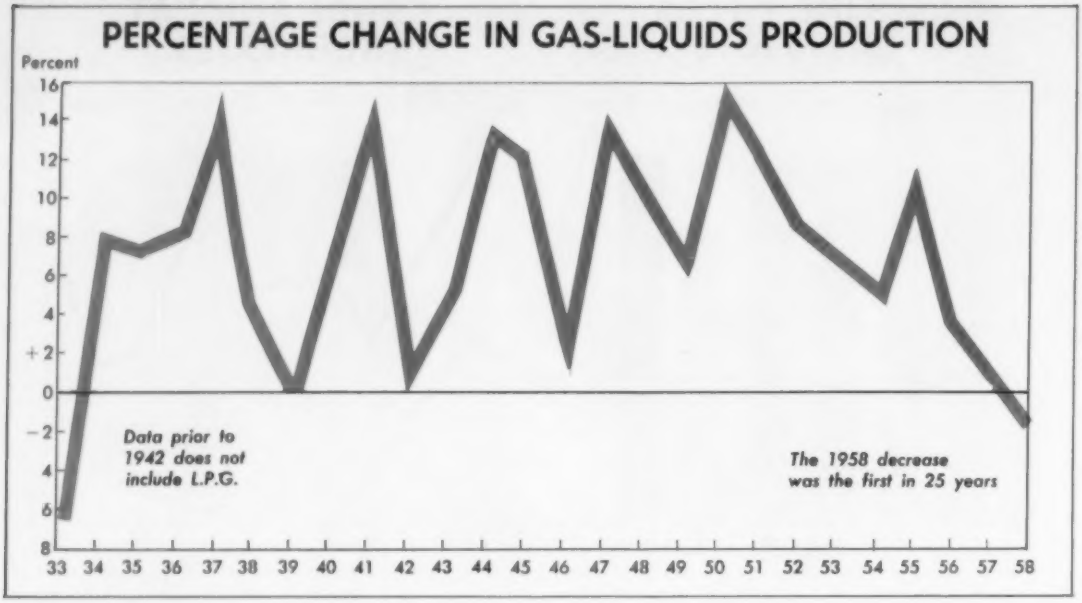
Crude runs will be up in 1959. The average for the year will top 8,000,000 bbl. daily for the first time. The total should be about 8,120,000 bbl. daily, based on increased demand and a small addition to product stocks.

. . . and runs by districts in the U. S.

(Thousands of barrels daily)

	1923	1928	1933	1938	1943	1948	1953	1954	1955	1956	1957	1958	% of Total 1958	% of Total 1923
East Coast	320	466	457	495	532	867	1,045	1,030	1,065	1,126	1,207	1,106	14.6	20.1
Appalachian 1	(*)	(*)	(*)	(*)	101	99	109	103	98	101	101	94	1.2	(*)
Appalachian 2	58	92	92	107	50	58	89	83	96	102	95	100	1.3	3.6
Ill., Ind., Ky.	140	270	321	447	727	908	1,277	1,276	1,369	1,405	1,387	1,381	18.2	8.8
Minn., Wis., Dak.	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)	(†)	86	95	99	1.3	(†)
Okla., Kans., Mo.	193	304	265	305	340	452	589	601	671	685	703	710	9.3	12.1
Texas Inland	60	123	157	183	200	246	256	238	254	272	271	273	3.6	3.8
Texas Gulf	223	385	440	844	918	1,392	1,698	1,689	1,841	1,957	1,866	1,738	22.9	14.0
Louisiana Gulf	87	143	107	128	156	435	550	573	656	696	654	632	8.3	5.5
Ark., La. Inland	25	64	51	66	74	81	86	88	91	94	93	95	1.3	1.6
New Mexico	(‡)	(‡)	(‡)	(‡)	9	13	19	19	21	24	26	24	0.3	(‡)
Other Rky Mtn.	74	71	39	68	87	151	235	238	255	268	273	266	3.5	4.6
West Coast	412	577	431	549	723	848	1,047	1,020	1,063	1,121	1,144	1,079	14.2	25.9
Total U. S.	1,592	2,495	2,360	3,192	3,917	5,550	7,000	6,958	7,480	7,937	7,915	7,597	100.0	100.0

*Included in Appalachian 2. †Included in Ill.-Ind. and Okla.-Kans. ‡Included in Rocky Mtn.



Gas-liquids output shows slight drop

TOTAL PRODUCTION at natural-gasoline and cycling plants decreased about 1.5% in 1958. This loss followed a string of annual gains that had lasted for a quarter of a century. The last decrease was reported for 1933 by the Bureau of Mines.

There is an even chance that the record run of increases goes back of 1933 because the bureau was reporting only natural-gasoline production at plants in 1933 and, there was a gain in LP-gas sales for the year amounting to about 4,800,000 gal.

Total plant production for 1958 was about 33,349,000 gal. daily. This total is based on production data for 10 months from the Bureau of Mines, current reports on LP-gas by the statistics department of API, and estimates of other production in November and December, based on production allowables and trends.

Plant output for 1958 represents a decrease of 595,000 gal. daily or 1.5% from the Bureau of Mines' revised total for 1957.

The drop in production in 1958 was not due to lack of capacity at plants. Total throughput capacity at the first of the year was 28.63 billion cubic feet of raw gas daily compared with 27.63 billion early in 1957. Plant operators could strip liquids from an extra billion cubic feet of gas daily in 1958 but had a decrease in liquid output of more than half a million gallons daily.

Part of the cutback was due to a reduction in the volume of raw gas, particularly casing-head gas. The big reduction in oil-well allowables in Texas tended to reduce the volume of gas from producing oil wells. For the first 10 months of the year, casing-head-gas production in Texas was running 12.3% behind production for the same period in 1957.

However, Texas production of both gas and gas liquids increased in the last 2 months of the year. Output from oil wells was based on 11 producing days in November and 12 in December. The first 10 months averaged only 9.9 producing days.

Operators may set a new record for crude production next year. More crude will mean more casing-head gas for plants. This extra wet gas and increases from gas fields are the basis for a projected gain of 5.8% in gas-liquids production for 1959.

LP-gas trends . . . Despite the drop in total liquids from plants in 1958, production LP-gas showed a modest increase. Production for the year averaged about 18,470,000 gal. daily for a gain of 1.3% over the previous record set in 1957.

Production of LP-gas has set a new record every year since plant data for this product were first published by the Bureau of Mines in 1941. The growth in importance of this light product is shown by its portion of total plant output over the years.

In 1942, production of LP-gas represented only 22% of all products stripped from natural gas that year. Its position had increased to 39.1% of the total in 1950 and to 55.2% for 1958. Another small improvement in position is expected for 1959. Total LP-gas production for the year will average about 19,860,000 gal. daily, representing 56.1% of plant output and a gain of 7.5% over the total for 1958.

The LP-gas consumption pattern has been changing in the past few years. A larger portion of the total is going for fuel and chemical uses and less for blending into motor fuel at refineries.

For the first 10 months of 1958, total plant production of LP-gas was showing a gain of about

PRODUCT OUTPUT AT NATURAL-GASOLINE AND CYCLING PLANTS—1958*

(Thousands of gallons daily)

	LP-gas	Natural gasoline	Other	Total	Per cent increase
Appalachian	460	83	1	544	—26.6
Ill.-Mich.	947	56	4	1,007	—5.9
Kentucky	421	104	....	525	—9.2
Kansas	328	309	1	638	4.6
Oklahoma	1,816	1,202	10	3,028	5.5
Nebraska†	173	55	....	228	7.0
Arkansas	150	95	9	254	—1.2
Louisiana	1,090	802	1,344	3,236	6.4
Gulf	594	558	642	1,794	11.6
Inland	496	244	702	1,442	0.6
Mississippi	26	48	21	95	—1.0
New Mexico	1,286	585	31	1,902	1.3
Texas	10,346	5,913	1,796	18,055	—2.7
Texas Gulf	1,942	1,489	703	4,134	—0.5
West Texas	4,255	1,679	7	5,941	—5.4
East Texas	482	283	11	776	—12.1
Panhandle	1,705	1,089	14	2,808	2.4
Other Texas	1,962	1,373	1,061	4,396	—2.5
Rocky Mtn.	389	285	12	686	6.5
California	1,035	2,086	130	3,251	—3.8
Total U. S.	**18,467**	**11,623**	**3,359**	**33,449**	**—1.5**

*Ten months actual, two months estimated. †Includes North Dakota.

TOTAL PLANT PRODUCTION BY YEARS

(Thousands of gallons daily)

	1953	1954	1955	1956	1957	1958*
Appalachian	559	521	899	770	741	544
Ill.-Mich.	466	929	961	1,025	1,070	1,007
Kentucky	580	520	614	777	578	525
Kansas	592	567	580	534	610	638
Oklahoma	2,323	2,553	2,784	2,920	2,871	3,028
Nebraska	(†)	(†)	130	200	213	228
Arkansas	311	298	286	266	257	254
Louisiana	2,612	2,621	2,940	2,947	3,041	3,236
Gulf	1,155	1,130	1,386	1,582	1,607	1,794
Inland	1,457	1,491	1,554	1,366	1,434	1,442
Mississippi	138	118	97	97	96	95
New Mexico	802	1,235	1,478	1,684	1,877	1,902
Texas	15,145	15,662	17,640	18,294	18,565	18,055
Texas Gulf	3,209	3,587	3,885	3,941	4,155	4,134
West Texas	4,242	4,612	5,737	5,987	6,278	5,941
East Texas	1,348	1,214	1,197	972	883	776
Panhandle	2,335	2,070	2,591	2,715	2,741	2,808
Other Texas	4,011	4,179	4,230	4,677	4,508	4,396
Rocky Mtn.	340	374	433	560	644	686
California	3,583	3,616	3,536	3,517	3,381	3,251
Total U. S.	**27,451**	**29,014**	**32,378**	**33,591**	**33,944**	**33,449**

*Ten months actual, two months estimated. †Included with Kansas.

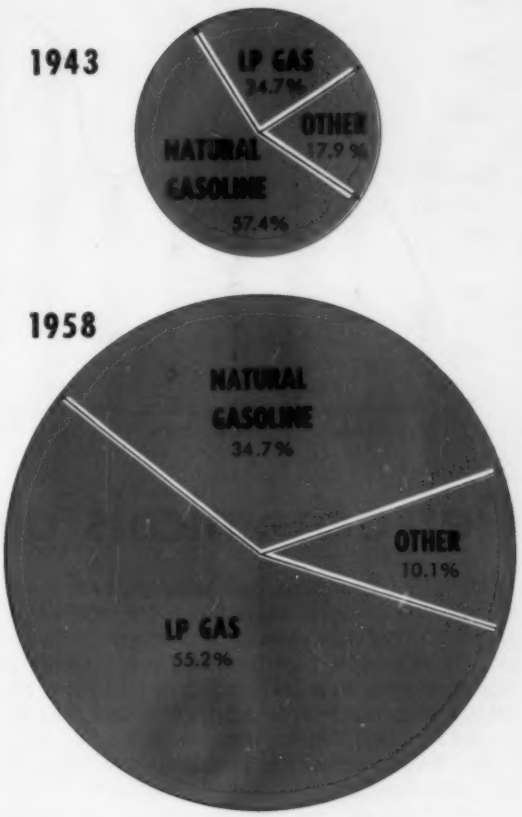
PRODUCT OUTPUT BY YEARS

(Thousands of gallons daily)

	LP-gas	Natural gasoline	Other	Total	Per cent incr. Total	Per cent incr. LPG
1944	3,196	5,981	2,302	11,479	13.7	28.1
1945	‡3,562	‡7,157	2,171	12,890	12.3	11.4
1946	3,763	7,472	2,083	13,318	3.3	5.7
1947	5,074	7,627	2,507	15,208	14.2	34.8
1948	5,880	8,295	2,659	16,834	10.7	15.9
1949	6,518	8,388	3,171	18,077	7.4	10.9
1950	8,198	8,963	3,780	20,941	15.8	25.8
1951	9,761	9,832	3,969	23,562	12.5	19.1
1952	11,445	10,277	3,923	25,645	8.8	17.2
1953	12,659	10,769	4,023	27,451	7.0	10.6
1954	14,259	11,248	3,507	29,014	5.7	12.6
1955	16,363	12,214	3,801	32,378	11.6	14.8
1956	17,725	12,128	3,738	33,591	3.7	8.3
1957	18,234	12,327	3,383	33,944	1.1	2.9
1958*	18,467	11,623	3,359	33,449	—1.5	1.3
1959†	19,860	12,000	3,540	35,400	5.8	7.5

*Ten months actual, two months estimated. †Forecast. ‡Isopentane included in natural gasoline, starting with 1945.

CHANGE IN PRODUCTION PATTERN AT NATURAL-GASOLINE AND CYCLING PLANTS



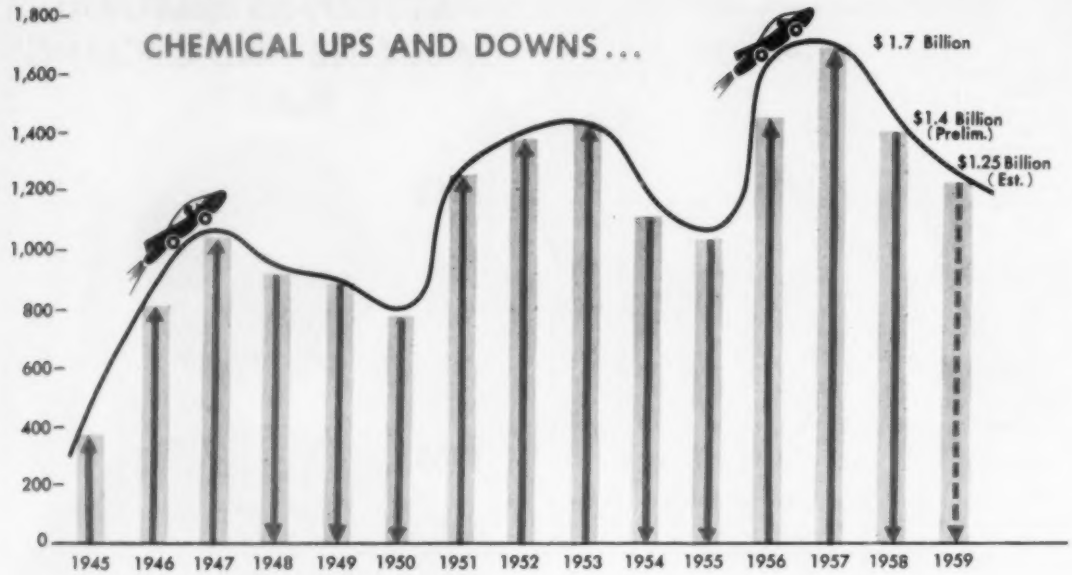
0.4% over the same period in 1957. However, shipments to refineries for blending into motor fuel were down 11.7%.

In addition to increased shipments from plants for fuel and chemical use, more liquefied refinery gas was produced than in 1957. Refinery production of LRG for the first 10 months of the year was up 6.2% over the corresponding period of 1957.

The final result of these changes was a gain in domestic demand for LP-gas in 1958 that averaged better than 8% over 1957.

Natural gasoline . . . Production of natural gasoline averaged about 11,623,000 gal. daily in 1958 compared with 12,327,000 gal. daily in 1957. This shift represents a drop of 5.7%.

The increasing demand for high-octane motor fuel is bringing a change in natural-gasoline production. The trend seems to be toward removal of the butane from natural, and processing the heavier components to higher-quality blending materials for motor fuel. If the stripping is done at plants, production of LP-gas will account for still larger percentages of total plant output in the future.



Petrochemicals glut curbs spending

FOR THE CHEMICAL and allied products industry we estimate capital expenditures for 1959 will be about 1.25 billion dollars. This represents a decline of 11% relative to 1958 for which year preliminary SEC figures show capital spending of 1.4 billion. The 1958 figure, however, is nearly 19% less than the record high of 1.7 billion spent in 1957.

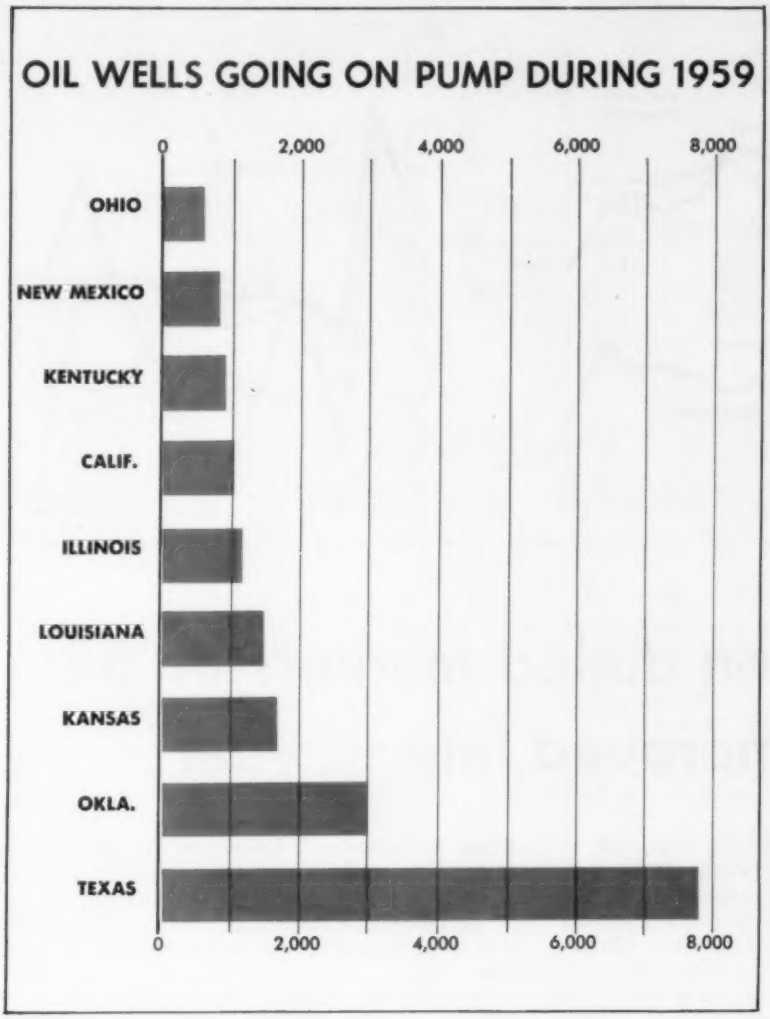
- **Surplus capacity** is a relatively new factor for the petrochemicals portion of the industry. It calls for the "hard sell" and the emphasis on selling can be seen on all sides, even in the shuffling of boards of directors. Historically, declines in capital spending have occurred before, as shown by the chart, in accordance with the dips in the over-all economy. But in recent years, after periods of rapid expansion, petrochemicals here experienced overcapacity in ammonia, polyethylene, and butadiene. Now, following the record spending of '57, some of the old-line chemical derivatives, such as ethylene oxide-glycol, have been producing through 1958 at lower rates relative to capacity than before.
- **Offsetting this** are the needs for: (1) replacement of worn-out or obsolescent facilities, and (2) commercial development of new or improved products. For 1958 the chemical industry capital depreciation alone amounted to roughly 1 billion dollars.
- **Capital spending** in 1960 is expected to decline again, but only slightly. Also, as the current recession saucered out, overcapacity became less of a worry. Continued growth is seen through 1965 at these rates: (1) aliphatics, 10-12% per year, (2) aromatics, 9-10%, and (3) inorganics, 4-5%. (See R. L. Bateman in The Oil and Gas Journal, September 1, 1958 page 126). These are not the 25% per year and higher growth rates experienced by petrochemicals heretofore but are still quite respectable.

Polyethylene capacity is now over 1 billion pounds per year in the U. S. Production for 1958 has been estimated at nearly 850 million pounds. Prospects are for even more new polyethylene capacity to go in the next few years, although exports will decline. Polypropylene plants are now in operation or being built as follows: Two in the U. S. and one each in Germany, Italy, Austria, and Japan; the whole totalling 125 million pounds per year of which 60 million is in the U. S. Development of polypropylene fibers is an exciting prospect.

Ammonia in Balance?

A number of factors, mainly higher farm income, has brightened the outlook for ammonia and has led to predictions of a balance between ammonia capacity and demand in the near future. One economist, basing his estimate in part on factors other than farm income, has predicted a balance for ammonia by 1961 (OGJ, Dec. 15, '58, p. 109). This is predicted on the assumption that there will not be another big rush into the ammonia business by new investors.

In the stronger competitive phase of petrochemical development, a number of innovations have been introduced to cut costs. A good example is in the field of synthetic detergents, specifically in those based on propylene tetramer and benzene. One innovation is the detergent alkylate plant, such as that of Shell Oil Co. of Canada, in which commercial dodecylbenzene is made. Another is the batching of dodecene (propylene tetramer) through pipeline as initiated by Continental Oil Co.



State score on pumpers

Alabama	37
Alaska	1
Arizona	3
Arkansas	200
California	1,000
Colorado	256
Illinois	1,139
Indiana	341
Kansas	1,679
Kentucky	692
Louisiana	1,400
Michigan	170
Mississippi	112
Montana	147
Nebraska	245
New Mexico	681
New York	260
N. Dakota	158
Ohio	607
Oklahoma	2,990
Pennsylvania	258
S. Dakota	3
Texas	7,799
Utah	83
W. Virginia	18
Wyoming	318
Total	20,514

20,514 wells to go on pump in '59

Once more Texas and Oklahoma are responsible for more than half of the total. Four Corners and Denver basin will show increase.

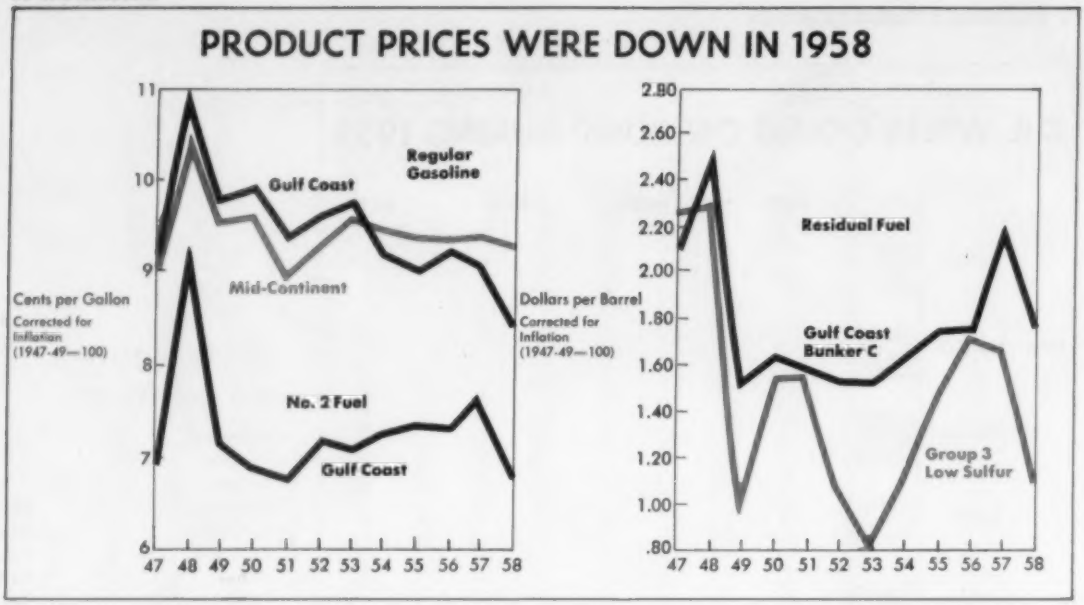
INCLUDING NEW WELLS and older ones with declining pressures, this year's estimate shows that 20,514 wells will be put on the pump before the end of 1959.

Texas leads again with almost 8,000. The states in the Four Corners area show more activity than before, and Denver basin development is responsible for an increase in the estimate for Colorado.

As in past years, many wells will go on the pump in the "secondary-recovery belt." New water floods and more experimentation with thermal-recovery methods will put old wells back on production, and new wells will be drilled in optimum locations.

Reservoir conditions in several states are such that each new well drilled is automatically a pumper, either at completion or soon after. Some of these are: Illinois, Indiana, Kansas, Kentucky, New York, Ohio, and Pennsylvania.

In a few years, Alaska may occupy a pole position in this tabulation, but development so far is behind schedule if size is any criterion.



Price erosion dulled markets in '58 but tone improved late in year

MOST PETROLEUM MARKETS were soft in 1958, particularly in the early months of the year. The trend followed a definite pattern.

. . . Product stocks reached high levels following the reopening of the Suez Canal in 1957. Correction was not completed by the end of the year.

. . . High product stocks in the early months of this year created marketing problems that resulted in distress selling. The end result of distress selling was lower product prices.

. . . Lower prices reduced the refiner's income from products made from a barrel of crude.

. . . Lower refinery realization forced certain adjustments in crude prices.

The end result was a gradual process of price erosion that extended in cases almost to the year's end.

Stock corrections . . . The refined-product-stock total at the start of 1958 was 44 million barrels above the total on January 1, 1957, and this 1957 total was up 58 million barrels from the year before. This boost of more than 100 million barrels in 2 years was enough to keep many product prices under pressure during the early months of 1958.

By the middle of the year, product stocks topped the previous year's total by only about 7 million barrels but still were up 57 million from 1956. Refiners had been working hard at getting stocks down to reasonable levels but had not finished the job by midyear.

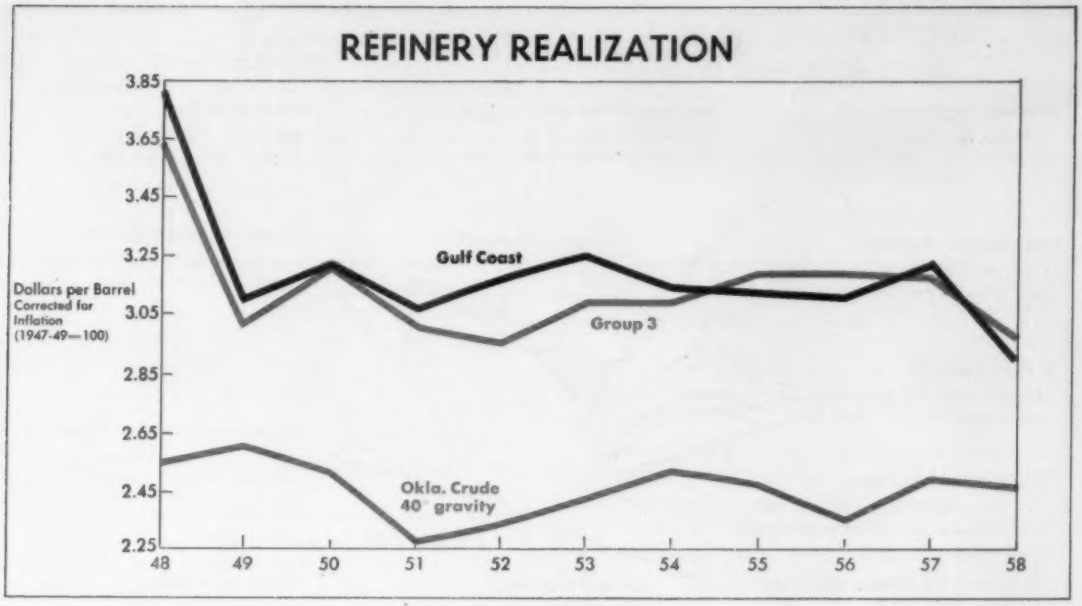
Lower realization . . . Refiners had a very definite drop in income from products made from a barrel of crude this year. The drop was especially sharp on the Gulf Coast because the comparison is made with prices created by high demands during the Suez crisis.

However, the prices during the early months of 1957 were as low or lower than they were in 1948 if correction is made for inflation. The inflation-adjusted price for No. 2 fuel on the Gulf Coast was 7.67 cents a gallon for 1957 compared with over 9 cents in 1948. On the same basis, bunker C sold for $2.20 a barrel last year compared with $2.53 in 1948.

Prices were not abnormally high last year, but this year's prices were low. The refiner with reduced income had to look for a way to cut costs even while he was in the process of adjusting supply to keep it in line with demand.

Lower crude prices . . . Since crude is the big expense item for the refiner, he started looking for ways to lower his over-all crude cost. In some cases the search led to certain shifts in crude supply, based on crude values for a given refinery. In other areas, the job was started by price cuts for some crudes.

This adjusting process started in 1957 but was continued throughout most of 1958. When crude buyers raised prices in January 1957, the general increase was about 25 cents a barrel, but many



crudes, located conveniently for export or for movement to tidewater refineries, were boosted 35-40 cents a barrel. These crudes were among the first to be cut after Suez reopened.

Downward adjustments were very severe for heavy crudes on the West Coast. A combination of weather, changes in industrial activity, and increased availability of natural gas created a heavy-fuel surplus in the area.

The residual-stock total at the end of June 1958 was more than double the total for June 1957. The result was sharp cuts in residual and heavy crude prices.

The nationwide outlook was much brighter in the late months of 1958. Corrected inventories, a better supply-demand balance, the outlook for better demand in 1959, all combined to give a better tone to petroleum markets for the opening of 1959.

Representative prices—products . . . and crude oils

Spot-market quotations of leading suppliers
(Cents per gallon except dollars per barrel for residual)

GROUP 3

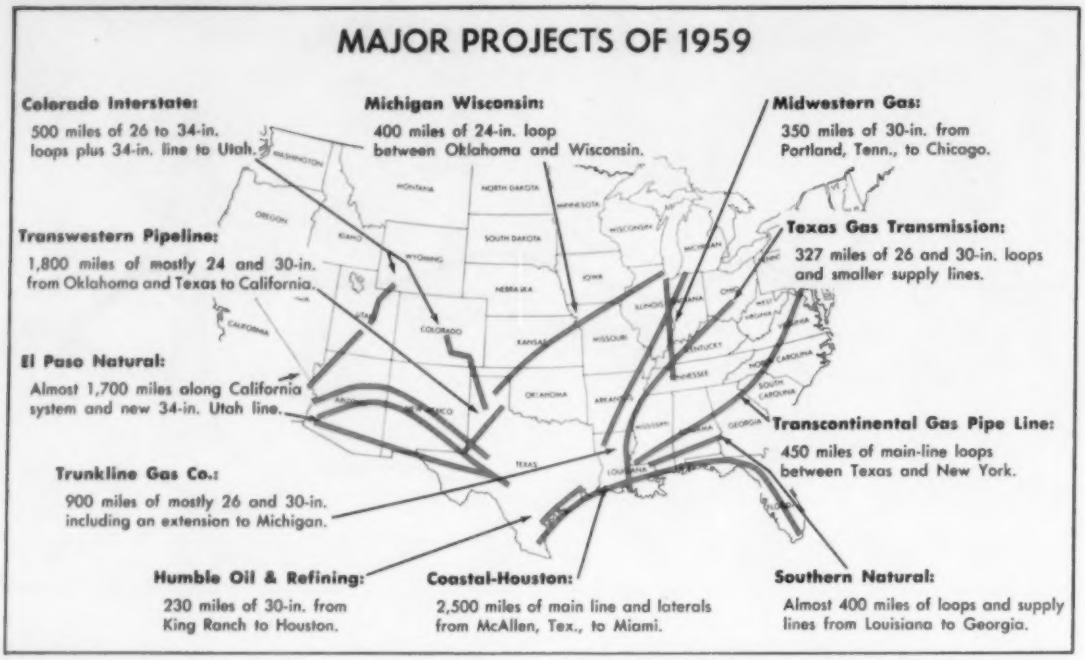
	Regular gasoline	Kerosine	No. 2 distillate	No. 6 residual
January	11.25-11.75	9.85-10.20	8.85-9.20	1.43-1.56
February	11.25-11.75	9.50- 9.75	8.50-8.75	1.23-1.38
March	11.13-11.63	9.38- 9.63	8.38-8.63	1.21-1.30
April	11.00-11.50	9.25- 9.50	8.25-8.50	1.25-1.30
May	11.25-11.50	9.25- 9.50	8.25-8.50	1.25-1.30
June	11.63-11.88	9.25- 9.50	8.25-8.50	1.25-1.30
July	11.90-12.15	9.30 -9.50	8.30-8.50	1.26-1.31
August	11.88-12.25	9.56- 9.75	8.56-8.75	1.30-1.35
September	11.75-12.25	9.75-10.00	8.75-9.00	1.33-1.39
October	11.65-12.00	9.85-10.00	8.85-9.00	1.40-1.50
November	11.50-11.63	10.00-10.00	9.00-9.00	1.50-1.50
December	11.50-11.63	10.15-10.25	9.15-9.25	1.58-1.66

GULF COAST

January	10.70-11.20	8.75-9.20	8.65-9.10	2.47-2.70
February	10.25-10.50	8.50-8.75	8.25-8.50	2.25-2.50
March	10.06-10.50	8.56-8.75	8.16-8.41	2.25-2.43
April	10.00-10.50	8.53-8.75	8.00-8.25	2.25-2.40
May	10.00-10.50	8.50-8.75	8.00-8.25	2.23-2.25
June	10.06-10.56	8.50-8.75	8.06-8.25	2.20-2.25
July	10.83-10.85	8.58-8.68	8.28-8.33	2.20-2.25
August	11.00-11.00	8.88-8.88	8.63-8.63	2.20-2.25
September	10.88-11.00	8.88-8.88	8.63-8.63	2.15-2.21
October	10.50-10.50	9.00-9.03	8.63-8.63	2.00-2.00
November	10.50-10.50	9.19-9.19	8.69-8.69	2.00-2.00
December	10.50-10.50	9.54-9.54	9.13-9.13	2.00-2.00

Typical crude prices
Dollars per barrel
(Flat prices for 40-44.9° gravity)

	Dec. 1956	Jan. 1957	Dec. 1957	Dec. 1958
Texas				
Mirando (29° & above)	3.13	3.58	3.33	3.33
Refugio (light)	3.20	3.65	3.55	3.35
East Texas (Flat)	2.90	3.25	3.25	3.25
Conroe (Flat)	3.13	3.53	3.53	3.53
West Texas (Ellenburger)	2.90	3.15	3.15	3.15
West Texas (Sour)	2.77	3.02	3.02	3.02
Van	2.73	3.08	3.08	3.08
North Texas (Clay Co.)	2.90	3.15	3.15	3.08
Seeligson	3.10	3.50	3.45	3.20
Hawkins (20° & above)	2.25	2.60	2.60	2.60
Oklahoma (sweet)	2.90	3.15	3.15	3.08
Oklahoma (heavy)	2.80	3.05	3.05	2.95
Elk City, Okla	2.90	3.15	3.15	3.08
Kansas	2.90	3.15	3.15	3.08
Illinois	2.90	3.15	3.05	3.00
Cotton Valley, La. (Cond.)	2.90	3.25	3.25	3.10
Delhi, La.	2.95	3.35	3.35	3.25
Baxterville, Miss. (Crude)	1.50	2.00	2.00	2.00
Elk Basin (Heavy)	2.72	2.95	2.95	2.95
Aneth, Utah			3.15	3.00
Cabin Creek, W. Va.	4.18	4.18	4.15	3.40
Cut Bank, Mont.	2.90	3.15	3.15	3.15
Bisti, New Mex.			3.15	3.00
Long Beach, Calif. (37°-37.9°)	3.43	3.68	3.68	3.60
Kettleman Hills, Calif	3.45	3.70	3.70	3.70
Colinga, Calif.	3.43	3.68	3.68	3.58
Redwater, Canada	2.49	2.49	2.63	2.56
Bachaquero, Venezuela	2.18	2.23	2.23	1.93
Arabian (36°-36.9°)	2.69	2.69	2.59	2.49


MAJOR PROJECTS OF 1959
Colorado Interstate:
500 miles of 26 to 34-in. loops plus 34-in. line to Utah.
Michigan Wisconsin:
400 miles of 24-in. loop between Oklahoma and Wisconsin.
Midwestern Gas:
350 miles of 30-in. from Portland, Tenn., to Chicago.
Transwestern Pipeline:
1,800 miles of mostly 24 and 30-in. from Oklahoma and Texas to California.
Texas Gas Transmission:
327 miles of 26 and 30-in. loops and smaller supply lines.
El Paso Natural:
Almost 1,700 miles along California system and new 34-in. Utah line.
Transcontinental Gas Pipe Line:
450 miles of main-line loops between Texas and New York.
Trunkline Gas Co.:
900 miles of mostly 26 and 30-in. including an extension to Michigan.
Humble Oil & Refining:
230 miles of 30-in. from King Ranch to Houston.
Coastal-Houston:
2,500 miles of main line and laterals from McAllen, Tex., to Miami.
Southern Natural:
Almost 400 miles of loops and supply lines from Louisiana to Georgia.

Gas lines lead construction upturn

NATURAL-GAS LINES will make a strong comeback in 1959, although they can hardly be said to have "slumped" last year, assuring another big year in pipeline construction.

When the Supreme Court reversed the Memphis decision, it reinstated long-established rate-making procedures. The resulting improvement in the regulatory and financial climates permits the natural-gas industry to resume its normal rapid growth.

The increase in gas-line building next year will be offset in part by an expected decline in crude-oil and products construction. But in the U. S., as well as abroad, 1959 is scheduled to see greater activity. Canada is the lone outstanding soft spot.

Here is the 1959 outlook, based on a world-wide survey of companies by The Oil and Gas Journal:

... **U. S. natural gas**—12,500 miles compared with 10,000 miles in 1958.

... **U. S. crude**—2,000 miles compared with 3,100 in 1958.

... **U. S. products**—1,000 miles compared with 2,000 in 1958.

... **Canadian natural gas**—800 miles compared with 2,300.

... **Canadian crude oil**—450 miles compared with 550.

... **Foreign**—5,500 miles compared with 5,300.

Total mileage laid in the United States last year was 15,100. This year's figure is estimated at 15,500, which must be considered a big year although it will be below the 1957 record of 19,900 miles.

This looms as an in-between year for Canada. The country's two big gas lines have been completed, and export approval still stands in the way of proposed projects. Foreign construction will be stepped up slightly.

U. S. Natural Gas

The year 1958 started with rather poor prospects—poor by boom standards. The natural-gas industry, which has accounted for 80% of pipeline construction in recent years, was unsettled because of the November 1957 Memphis decision. The court of appeals ruling decreed that companies must obtain advance approval of customers before filing new rates with the Federal Power Commission. It raised the threat that transmission companies might have to refund up to 300 million dollars in revenue collected under increased rates.

One project involving 1,000 miles of large-diameter pipe, planned to start early in the year, was canceled. Major expansion projects were slow in clearing FPC.

Then activity started picking up. Several companies were able to negotiate rate settlements to comply with "Memphis." Projects emerged from prolonged FPC hearings. And the last half turned out to be a near-record construction period.

Although construction was down about 25%, it ended as a bigger year than many anticipated. El Paso Natural Gas, which seems to build the equivalent of a new system each year, laid 1,365 miles of pipe. Transcontinental Gas Pipe Line Corp. laid 900 miles, Southern Natural more than 700 miles, Tennessee Gas Transmission Co. almost 700 miles.

Natural Gas Pipeline Co. of America laid some 500 miles of 36-in., the largest single project ever

built of this diameter, and Gulf Interstate Gas Co. (now Columbia Gulf Transmission Co.) laid 350 miles of a new high-strength (X-56) pipe.

The Florida line, from McAllen, Tex., to Miami, finally got under way. This project, built by Coastal Transmission Corp. as far as Baton Rouge, La., and from there to Miami by Houston Texas Gas & Oil Corp., will be one of the biggest this year. The 1958-59 construction will total 2,500 miles.

Several big expansions are slated also. Work will begin early, too, portending an orderly construction period rather than last year's feast or famine for contractors. El Paso will lay 1,175 miles. Trunkline Gas Co. has 900 miles of construction which FPC is expected to approve.

Transco plans to lay 450 miles, Southern Natural almost 400 miles, Texas Gas Transmission Corp. more than 300 miles, Michigan Wisconsin Pipe Line Co. 400 miles, and Humble Oil & Refining Co. 250 miles.

This also appears to be the year that the Midwestern log jam will break. Tennessee Gas no longer has the opposition of competing lines for its affiliate, Midwestern Gas Transmission Co. The project from Portland, Tenn., where it would receive gas from the TGT system, to Joliet, Ill., for Chicago area customers, is independent of Canadian gas supply.

FPC has admitted the need for such a line, and hearings which reopen next month are expected to result in approval to build the 350 miles of 30-in. The northern section may be built when the Canadian Government decides that surplus gas is available from Trans-Canada Pipe Lines.

The forecast for 1959 did not include what is potentially the biggest project. Transwestern Pipeline Co.'s application to build 1,809 miles of line from Oklahoma and Texas fields to the California border will be up for decision sometime this year. Hearings, to be resumed in April, will be drawn out by lengthy questions of reserves and high prices.

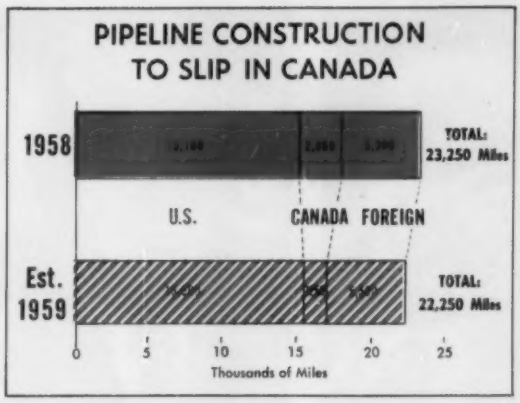
U. S. Crude and Products

Two new crude systems were built in 1958. Texas New Mexico Pipe Line Co. laid a 512-mile 16-in. line from Aneth, Utah, to Jal, N. M. Jayhawk Pipe Line Corp. built its 248-mile 10 and 12-in. trunk line from southwestern Kansas to Wichita.

Such large systems as Service Pipe Line Co., Sinclair Pipe Line Co., Magnolia Pipe Line Co., and Humble Pipe Line Co. were active with looping and modernization. This type of activity will continue during 1959. Shell Pipe Line Corp. is completing its Delta line, a 120-mile system from the Gulf of Mexico to New Orleans.

But no new systems comparable to Tex-Mex and Jayhawk were in sight at the first of the year. The demand for new pipeline capacity will be determined in part by what action is taken to limit imports.

Laurel Pipe Line Co.'s 440-mile 24 to 14-in. line from Philadelphia to Cleveland was the major products line laid last year. Other projects were the 265-mile 12-in. Wabash Pipe Line from Wood River, Ill., to Chicago and the 300-mile 6-in. West Emerald Pipe Line from Amarillo, Tex., to Albuquerque, N. M.



No new products lines have been announced for this year. One 500-mile project, not yet made public, is expected to materialize, however. The only big products line being pushed, the 2,500-mile LPG line from Houston to New York, proposed by the Katy and New York Central railroads, is still a question mark.

Canada and Foreign

Canada has completed its two big gas lines, Westcoast and Trans-Canada, with the final 853 miles of Trans-Canada being laid the past year. Westcoast has plans for immediate expansion. Alberta & Southern Gas Co. is working in conjunction with Westcoast on a joint line from Alberta to the U. S. border. Pacific Gas & Electric has asked for FPC authority to build a 614-mile line from the border to San Francisco.

These projects await export approval. The only gas lines which at this time appear certain to be laying any appreciable mileage during 1959 are Alberta Gas Trunk Line, which plans 245 miles to deliver more gas to Trans-Canada, and Saskatchewan Power Corp., which plans 267 miles.

The Alberta-Montreal crude line, opposed by Montreal refiners, hasn't advanced beyond the "proposed" stage. The Foothills LPG-sulfur line is also indefinite at this point.

Foreign construction was at a high level in 1958, and the pace will step up slightly this year. Argentina finally got under way on its 1,015-mile 24-in. gas line to Buenos Aires. Venezuela completed its Anaco-Caracas-Valencia gas line. Mexico's 490-mile 24-in. Jose-Colomo-Mexico City line and the Lacq-Paris line in France continue into 1959.

Major crude-line construction is under way in Algeria, where one line from Sahara fields to the Mediterranean has started and another is scheduled this year. The Wilhelmshaven-Cologne, Germany, 28-in. line has just been completed and the Rotterdam-Rhine pipeline is being built.

Creole, Shell, and Mene Grande built new crude lines in Venezuela during 1958, particularly to transport heavy crudes, and Lake Maracaibo discoveries on new concessions are spurring further construction. The Bolivian dream of an export line to the Pacific was realized last year with the completion of the Sicasica-Arica line to the Chilean coast.

LYNDON JOHNSON

SAM RAYBURN

The industry's hopes for avoiding crippling legislation in the months to come rest pretty largely on the leadership exercised by two old pros from Texas—Senate Majority Leader Lyndon Johnson and Speaker of the House Sam Rayburn. Their success in curbing the leftward tendencies of freshmen may determine . . .

How oil will fare in new Congress

SELDOM in modern history has the petroleum industry faced a Congress that appeared more hostile than the present one.

The Democratic landslide last November left many a boulder in the path of Big Business. As a promient member of the Big Business family, the petroleum industry can expect its relations with the Government to follow a rocky path for at least the next 2 years.

Trend slower . . . Last month the Supreme Court reversed, or at least slowed, the trend toward more and more controls on the industry. It knocked out a lower-court decision which would have required interstate pipeline companies to get advance approval of their customers before raising gas prices.

That ruling has brought a new round of optimism among natural-gas producers and transmission companies. Largely as a result of the Supreme Court decision, 1959 promises to be a boom year in growth of pipelines and development of reserves for future markets.

But the Supreme Court ruling solved only one phase of the legal problems confronting the natural-gas branch of the industry. That phase was relatively short-lived, lasting slightly more than a year.

Natural-gas producers, in particular, still face a greater and longer-lasting hardship resulting from the earlier Supreme Court ruling which subjected them to utility-type price controls administered by the Federal Power Commission. This problem promises to be with them for some time.

The Harris-O'Hara gas bill died with the closing gavel of the last session. It was cleared by House committees in 1957, but neither house voted on it. It or a smaller measure to end federal price controls on producers would have to be reintroduced and go back to committee before getting even as far as it did last time. Rep. Joseph P. O'Hara (R., Minn.), one of the sponsors of the earlier bill, has retired from the House.

No bill . . . There is scant hope that the new Congress will vote on—much less pass—another natural-gas bill. Gas producers seem destined to remain under federal regimentation for at least the next 2 years. Unless the political winds change by then, the outlook in the next Congress is likely to be no better.

As far as it affects the petroleum industry directly, the gas issue has been a dominant question before Congress for several years. The spotlight shifted briefly to other industry issues, such as imports and depletion, but the temper of Congress was judged largely on its attitude toward government regulation of independent gas producers.

Last year, during its brief consideration of what had been considered a "side" issue, the Senate revealed a growing hostility toward the long-established depletion allowance. Suddenly, the industry was threatened with economic repercussions far surpassing those already felt by independent gas producers. The gas question was relegated to secondary rank.

The 27½% depletion allowance survived last year's sneak attack in the Senate. In fact, it was upheld by what appeared to be a comfortable margin—58 to 31.

But that margin gave little comfort to industry leaders. They remembered a Senate vote of 71 to 9 in favor of depletion as recently as 1951.

Last year's 58-31 vote in the Senate came on an amendment offered by Sen. William Proxmire (D., Wis.). His proposal called for a graduated cut in the depletion allowance. It would have retained the present rate for producers with gross income of 1 million dollars or less while reducing it gradually to 15% for those who gross more than 5 million.

Proxmire's amendment was offered as a substitute to a straight reduction to 15%. This was proposed by his colleague, Sen. John J. Williams (R., Del.). The Williams amendment was defeated 63 to 26. Difference between the two votes illustrates the instability of some depletion supporters.

More Attacks

Last year's general elections served warning that the industry can expect more attacks on depletion. Proxmire and Williams are both back, along with most of their colleagues who supported their amendments last summer. Proxmire has been collaring new members of the Senate to get their support for a new antidepletion effort.

Whether or not he can round up a majority

of the votes in the Senate this year, Proxmire is confident he can get more support than he had last year.

A recent survey of depletion sentiment in the Senate indicated 48 members probably can be counted on to support the 27½% rate and that 32 are likely to favor a cut. The deciding vote apparently will rest with the 18 members, most of them new in the Senate, who have no voting record or have not taken a public stand on the depletion issue.

The antidepletion threat of last year's elections is apparent in that backers of the present rate lost 10 relatively sure votes while their opponents had a net loss of only 3. Because of the predominantly "liberal" tinge of the newcomers in the Senate, they are not a very promising group in which to recruit new support for depletion.

Much of the threat in the Senate is due to the fact that six depletion advocates did not seek reelection. Six more were defeated, while only four Senators who favored the Proxmire amendment lost in their bids for reelection.

On the other hand, 10 Senators who voted for Proxmire's depletion-slashing measure won reelection, and only 6 who voted against it were reelected.

House sentiment . . . The depletion sentiment in the House is less clearly defined than in the Senate. But it's generally assumed that the House would go along with nearly any reduction that could be put through the Senate.

The import issue is another major problem which may arise with new vigor in the current session.

The last Congress, in effect, tossed the problem into the lap of the President. Since then, a Cabinet-level dispute within the President's official family caused a delay in development of a lasting program to control oil imports. As a result, Congress is being pressured to reconsider the problem and to write its own solution.

By extending the Reciprocal Trade Act, Congress reconfirmed the President's authority to restrict imports if they are deemed excessive and constitute a threat to the national security.

Voluntary controls . . . Voluntary imports controls thus were upheld by Congress, and proposals for mandatory controls were rejected. But in recent months, critics of the voluntary program have renewed their demands for compulsory limitations.

To put teeth into the voluntary program, the President last year invoked the "Buy American Act." Companies which complied with the imports program were given preference in bidding for sales to the Government. But the penalty failed to offset the economic advantages enjoyed by a few companies which consistently imported more than their quotas.

Much of the congressional pressure for legislative controls comes from coal-producing states. This gives the imports controversy a new dimension. If Congress writes a control program, it may be designed not only to bolster the domestic oil industry but to protect the interests of competing industries as well. Any imports controls written into law carry the threat of further regimentation in the future.

On top of the other woes facing the oil industry, it has been singled out for a proposed tax increase. But here oil has some help.

Other industry groups, along with private motorists, are fighting the proposed tax increase on gasoline. The increase, recommended by President Eisenhower, would be earmarked for the federal road-building program.

The highway trust fund is threatened with a deficit, partly because the demand for gasoline did not live up to advance hopes. Opponents of the tax increase argue that it would counteract rising demand.

Other Issues

Other oil issues in Congress are likely to seem minor when compared with depletion, imports, and taxes. But some of them are highly controversial.

Another effort will be made to adopt antimerger legislation. One measure, proposed during the last session, would require advance notice to the Government for any merger involving corporate assets of 10 million dollars or more. The proposed merger then could be held up pending government scrutiny.

Oil shale promises to be back in the news this year. The Navy wants to take over the government plant near Rifle, Colo., and put it back into operation. The Department of Interior, which formerly operated the experimental plant, is opposed to Navy control.

The Navy also is pressing its plans to take over another petroleum reserve. A proposal submitted to the last Congress sought to turn San Nicolas, San Miguel, and Prince islands off the California coast into a naval reserve. Carl Vinson (D., Ga.), chairman of the House armed services committee, is spearheading the drive in Congress.

Pressure builds . . . Pressure has built up for a change in the Natural Gas Act to limit the Federal Power Commission's practice of granting temporary certificates for construction of gas lines. Further delays in clearing routine projects through the FPC may result.

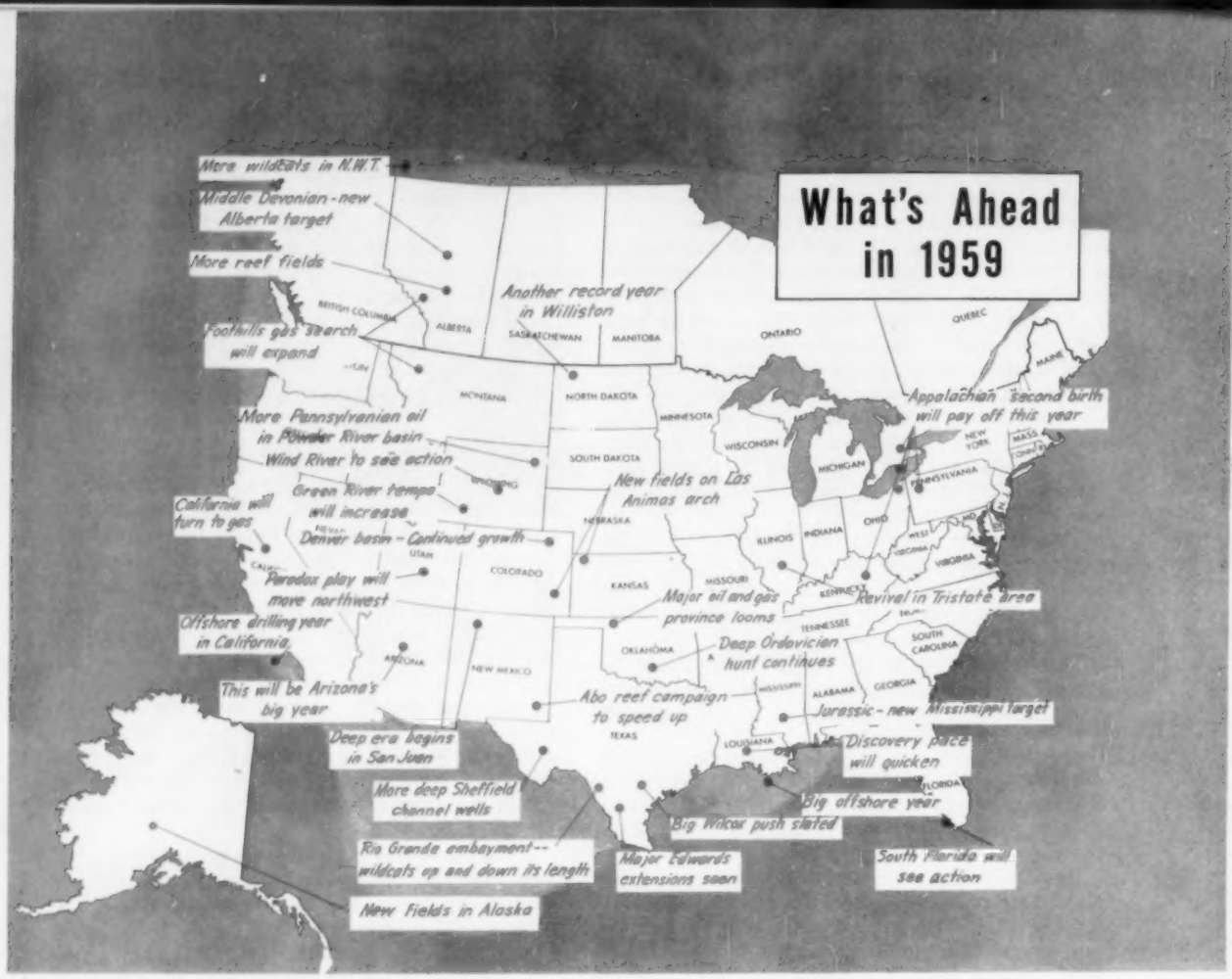
The Federal Power Commission also is likely to be called on the congressional carpet again. A special House subcommittee investigated FPC last year, along with several other federal agencies. Members were not quite satisfied with their findings, so the probe may be resumed by the new Congress.

Outside of Congress, several government departments will be busy on oil matters this year.

Interior startled the industry last year by temporarily shutting in wells in the Aneth, Utah, area to prevent gas waste. The precedent-setting order could lead to more stringent conservation measures on other federally controlled leases.

The Bureau of Land Management is making preparations for another sale of offshore leases. If the proposed sale of leases off Florida attracts enough interest, more lands off Louisiana may be opened up later in the year.

The Department of Justice, as usual, will be one of the busiest agencies dealing with oil. There are indications it may step up its "trust-busting" activities.



Oil finders must live dangerously

WHAT LIES AHEAD for exploration in 1959? Take a look at the sad state of affairs as far as new oil discovered in 1958 is concerned (page 138 of this issue), and the answer is obvious . . . more adventuresome wildcatting, both in proven and in virgin regions.

The industry cannot long permit production to outstrip newly discovered reserves. And it's a pretty sure thing that it **will** not. The continuing decline in net additions to reserves is a danger signal to every exploration manager in the United States and to every man on his staff. Exploration budgets must go **up** to provide for an increasing wildcat score every year—not a shrinking one. The responsibility for avoiding a meeting point between production and new oil found rests squarely on the shoulders of the geologists and geophysicists of this country.

Oil finders must plumb the depths of all known productive basins. They must move into the nonproductive ones. The offshore campaigns must resume a steady pace. The Alaskan search must get under way. And the research laboratories must begin to make their work pay off in barrels of newly found oil.

The deep campaigns in known oil basins are already under way; but they must be expanded and accelerated, and extended to **all** productive provinces. The increasing wildcat scores in the Appalachian states in 1958 reflect this trend to deep drilling in older regions.

There are still many nonproductive basins to be conquered, and there's reason to believe that they will pay off. The Black Mesa, Raton, Salina, Desha, Palo Duro, Black Warrior, Forest City, and South Georgia basins fall into this category of unexplored or barely explored prospects. There are many others.

The obstacles barring the way to a speedup in offshore drilling must be removed. It is here that our greatest hope for major undiscovered reserves must lie.

The Alaskan campaign will come. This is inevitable. And it won't be easy. But here again is a theater of operations that should pay off in giant proportions. The drilling will be as expensive as it is offshore, and as hazardous and difficult as it is in northern Canada. But the chances for success are far above average for the rest of the country.

This is the prescription for ailing reserves. To get it filled is up to the oil finder in 1959.

Here are the challenges for 1959

THE IMMEDIATE TARGETS for the 1959 wildcatter are indicated on the map across the way. They are widely scattered, and provide plenty of room to play. Each prediction on this map is based on some 1958 event of importance, and the fulfillment hinges largely on 1959 developments.

The dogsled country . . . Alaska, our thirty-third oil and gas-producing state, is a vastly important new target for U. S. wildcatters. The undeveloped fields so far discovered, plus the wide variety of basin prospects, indicate a really great oil potential here. It's as though a virgin Texas had been placed in the hands of the oil industry with a tag "Please develop." If the wildcats now in the planning stage for 1959 actually go down, we'll see some new Alaskan fields this year.

Still in the north, **western Canada** has three prime objectives for 1959. These are the Middle Devonian Beaverhill Lake reservoirs that have paid off so handsomely at Swan Hills and Kaybob, the Mississippian and Devonian gas reservoirs of Alberta's foothills belt, and the Devonian reefs in the western plains and the foothills. The chain of big gas pools that has emerged along the Pincher Creek, Savanna Creek, Jumping Pound, Waterton Park trend is only partly forged.

Tour of the basins . . . In the Rocky Mountain states, another record year is in store for the **Williston basin.** In 1958, North Dakota had its busiest drilling year; the interest has now spread to South Dakota and to eastern Montana. Look for an even bigger 1959.

The **Powder River basin,** scene of some significant Pennsylvanian discoveries last year, will see an upsurge in deep drilling, largely aimed at those same Pennsylvanian bull's-eyes.

The ardent hunt for gas in the **Green River basin,** stimulated by half a dozen excellent finds in recent months, will continue. This activity, initiated by the construction of the Pacific Northwest Pipeline through the basin, has been more than rewarding. Today, 20 large units are approved there and 24 more are in the works.

The **Denver basin,** down a bit in total 1958 drilling, can be expected to see more activity in 1959 as lease renewals come due and a steady discovery record continues.

In the **Paradox basin,** a speedup will develop in wildcat efforts west of the Colorado River, with fair prospects of success; a reef hit here would develop an entirely new province for Utah, and it seems to be in the cards.

In eastern Colorado, northwest Kansas, and southwestern Nebraska, the **Las Animas arch,** locale of several 1958 rank strikes, will see a busy year in 1959, with prospects of discovery good to excellent.

The **San Juan basin,** where the chief objective has always been the Middle Cretaceous Mesaverde and Pictured Cliffs sands, now has a new and deeper target in the Lower Cretaceous Dakota sands; a dozen discoveries in these sands during 1958 confirm the wisdom of a truly deep campaign throughout this basin. It will begin in 1959, when basement tests may become commonplace in San Juan.

In **Arizona,** scene of an important oil well in 1958, a most active and probably successful drilling year is anticipated for 1959. Oil shows in the northwestern corner of the state, plus the discovery in the northeastern part, point to a speedup in Arizona exploration.

On the West Coast . . . California, with an excellent 1958 offshore discovery under its belt at Summerland, now looks forward to more of the same for 1959; several of the offshore parcels flanking Santa Barbara County are already being drilled, and if predictions hold true, the state can hope for an array of major new fields in its tidelands during the next few years.

In the northern part of the state, watch for a stepup in wildcat drilling in the Sacramento Valley, aimed at the gas reservoirs of the Tertiary. Ready markets, reasonable depths, and fair prices will spur the drive.

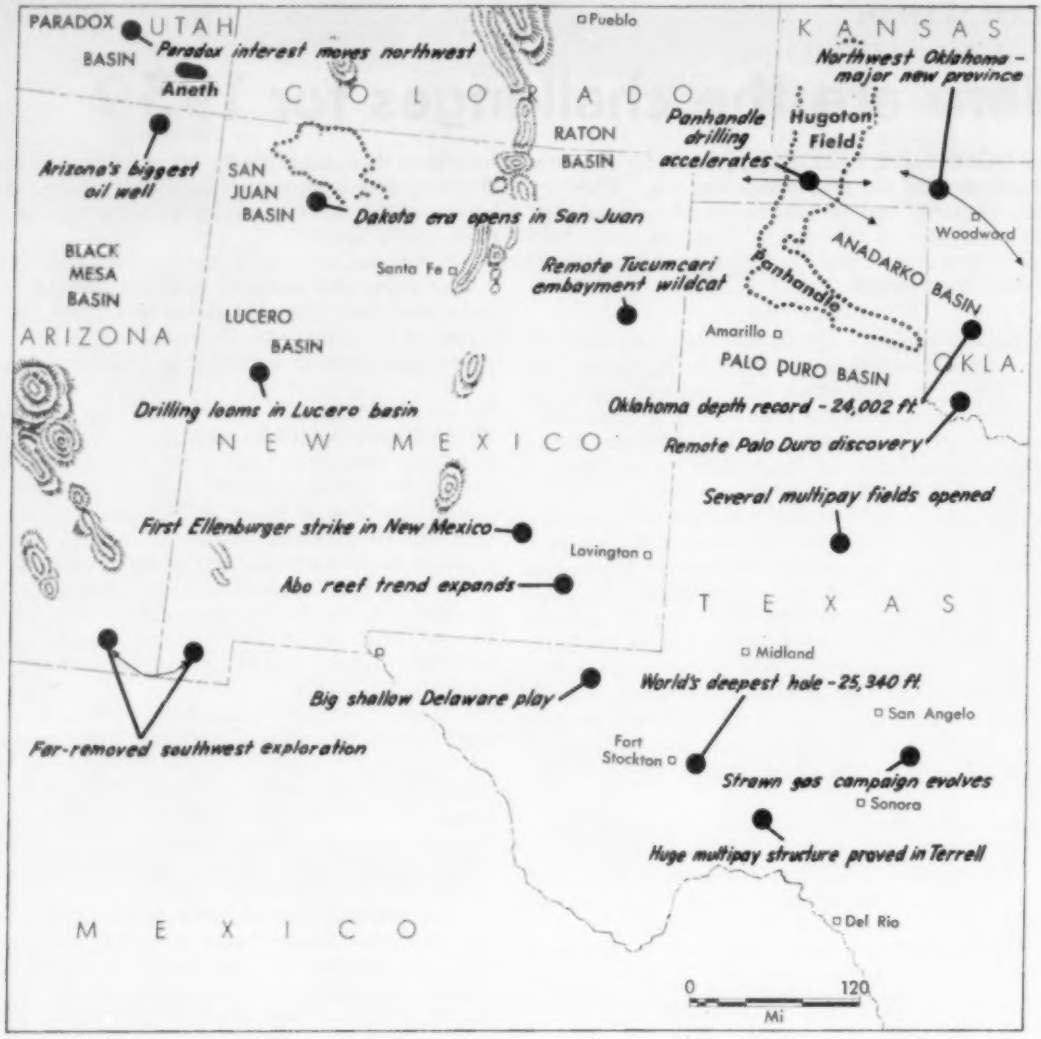
To Texas . . . In the Permian basin of West Texas and southeastern New Mexico, 1959 will bring an increasing number of superdeep wildcats throughout its length and breadth. The highly productive Abo reef of southeastern New Mexico will continue to be objective number one there; this reef play attained new intensity in 1958 as conservative estimates placed a value tag of 10,000 bbl. per acre on the reservoir.

The Sheffield channel, home of the world's deepest hole in Pecos County, Texas, will pick up impetus in 1959; it's doubtful we'll see another 25,000-ft. hole in 1959, but 20,000 ft. will be commonplace. The deep gas reservoirs of Devonian and Ordovician age, and the shallower ones in the Wolfcamp will continue to attract such exploration.

And Oklahoma . . . The Sooner State, amazing oldster of oil, continues to surprise the industry with its possibilities. A major oil and gas province is growing in the northwestern portion of Oklahoma in the northern reaches of the Anadarko basin and in the Panhandle counties. In the south, the hunt for the rich Ordovician sand reservoirs will pick up speed in 1959.

Far to the east . . . The deep-drilling era has arrived for the Appalachian province. Initiated by independent operators and leading gas companies of the eastern states, the play now is being joined by major oil and gas companies. Division exploration offices are being set up in Pittsburgh and other eastern centers. Chief target? Gas.

And Southeast . . . In the Southeast, Florida may once again enter the wildcat picture in 1959. Mississippi, after a most successful deep Jurassic play in 1958, looks forward to a repetition in 1959. South Louisiana will continue to be the mecca of the Miocene chasers, both on and offshore.



Bold ventures marked 1958 oil search

Southwest

EXPLORATION in the Four Corners and Southwest Desert regions of the country forged ahead on three fronts —the northwestern Paradox basin, the deeper rocks of the San Juan basin, and remote and scattered wildcatting in Arizona and New Mexico.

Discoveries were few but interest high in Utah's Paradox basin. Most of the year's oil finding was the expansion of the Aneth area fields as pipeline outlets tapped this oil giant.

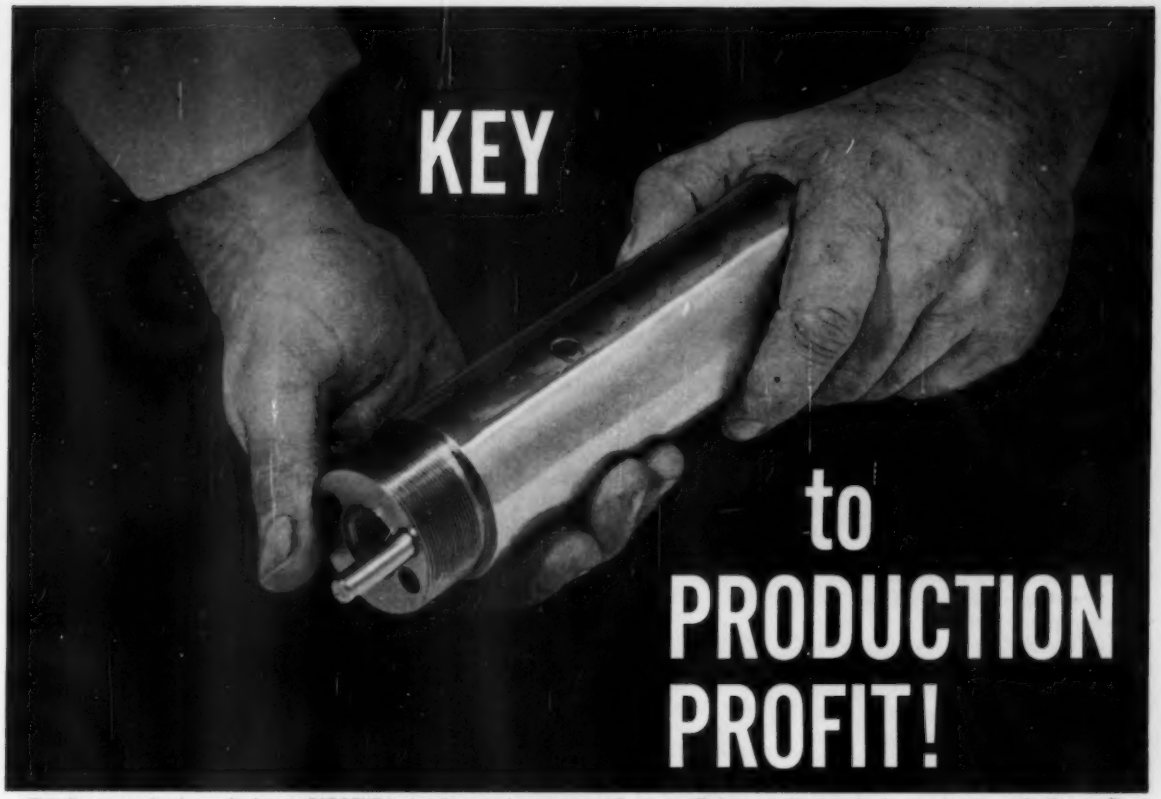
The year's important story in the basin was the push to the northwest flank. Tennessee Gas Transmission Co. found a Pennsylvanian reef far to the northwest of Aneth. Other wildcats in the area are probing this oil-barren part of the basin.

. . . **San Juan basin.** The Dakota Cretaceous sands have replaced the Gallup sands in New Mexico's San Juan basin as prime targets. An ever-increasing number of Dakota gas and oil pools is popping up in and around the Bisti-Gallup trend. There were more deep tests drilled in the basin in 1958 than in any other previous year.

Remote tests . . . A daring wildcat program got underway in 1958 in scattered areas of the Southwest. Highlights of this attack on virgin wildcat country included the first test in the Tucumcari embayment of the Palo Duro basin in eastern New Mexico, plans for a move into the newly named Lucero basin (just south of San Juan), rank wildcatting in Hidalgo County, New Mexico, and far-removed tests in Cochise, Yuma, and Mohave counties, Arizona, and one lone wildcat in Washington County, southwestern Utah.

. . . **Black Mesa.** Arizona got its biggest oil well in 1958 at Humble's East Boundary Butte field. The well made more than 500 bbl. per day.

What's coming? . . . Last year's exploratory trends in the Southwest will continue in 1959. This will be Arizona's big year. Look for new fields in the Black Mesa basin—possibly there



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will be a discovery in the Mohave area. New Mexico's San Juan will get a big play in the Dakota, while remote wildcatting in scattered areas of the state may produce some real headline grabbers. The on-again off-again Raton basin has a new drilling spree getting started. This could be a new oil and gas province. The year's top oil-hunting story in the Paradox will be on the northwest side where Pennsylvanian reefs will be the target.

West Texas

WEST TEXAS came up with something special in the way of exploration during 1958—in addition to the usual new-pay discoveries and heavy development drilling in known areas.

For years, operators have looked for big structures in the lesser explored basins of southern West Texas. Last year major developments took place in Val Verde basin, Sheffield channel and in the Delaware basin.

Outstanding discovery of the year was deep production at Brown-Bassett field in Terrell County. When the first deep well of the area found 1,700 ft. of Ellenburger section, and something like 1,200 ft. of gas column, its discoverers started making mental comparison between the new prospect and the big Puckett gas field in Pecos County, 40 miles to the northwest.

Completions in the new field to date have been in the Silurian and Ellenburger formations, but gas production has been assured from the Permo-Pennsylvanian and from Middle Permian zones. In its early stages, operators talked of a possible 70-section field development. At year's end, the proved field had four wells completed and was 5 miles long. Additional seismic work indicated the possibility of two big Ellenberger structures, rather than one, but the outlook was still rosy.

Sheffield channel was the scene of the world's deepest exploration, looking for the Ellenburger. The record well went to 25,340 ft., and another reached 23,400 ft. before starting to test back up the hole. At year's end these two wells were still testing various shows; a 19,000-footer had been completed as a gas-condensate discovery in the Wolfcamp, and Devonian gas had been established in a shallower portion of the channel.

Delaware basin expectation in all prior years has been pitched on ultra-deep drilling. In 1958 the trend reversed and a shallow play raged throughout the year. Delaware sand was the main objective.

This shallow wildcatting was (and is) in Reeves, Loving and Culberson counties, Texas, plus the southern portion of Eddy County, New Mexico.

Oklahoma

OKLAHOMA OIL-HUNTERS enjoyed one of their most successful and significant exploratory years in the state's long oil history. The wildcat drill in the Sooner State was aimed at two fronts—the northwestern Anadarko basin and the thick Ordovician section in the southern counties.

Northwest . . . A widespread pre-Permian play that began in spotted areas several years ago rammed to the top of the exploratory push in Oklahoma in 1958. Focal points of this spirited trek into remote wildcat areas were Major, Ellis, Woodward, Harper, and the Panhandle counties. Chief objective in this northwestern campaign was the Pennsylvanian rocks, but the most important discovery of the year was Sinclair Oil & Gas Co.'s North Buffalo field in Harper County. This field was opened at the 1 Holcomb with prolific Arbuckle production — the first in this wide expanse of prairie country. Field offset wells opened up rich Pennsylvanian production. The Pennsylvanian discovery, a triple-pay strike, was the 1 Rosa Lee Kuhn.

Morrow-Pennsylvanian gas and gas-distillate fields were tapped in Ellis, Harper, and Woodward counties. At the east end of the big play Northeast Cheyenne Valley field became a big producer of oil in the Cherokee-Pennsylvanian. Other Pennsylvanian strikes were recorded in the Panhandle counties, the most important being inside Hugoton gas field. Rich Morrow oil pools were opened and expanded inside this Permian gas area in Texas County.

Southwest . . . The world's second-deepest hole was put down in Elk City field, Beckham County, by Shell Oil Co. The 5 Rumberger went to 24,002 ft. before backing up the hole for tests. Another well, Howard & Howell 1 Anadarko basin, was below 20,000 ft. at year's end in Caddo County.

South . . . Southern Oklahoma's big Ordovician frontal attack centered in Cleveland, McClain, Love, Marshall, and Bryan counties. Thick Oil Creek, Tulip Creek, Bromide, and McLish sands yielded important discoveries throughout this region. Perhaps the most important of these strikes was Sinclair's discovery at East Durant, moving Ardmore basin production to the very edge of the Ouachita overlap.

What's ahead . . . There are three definite trends of exploration in Oklahoma—deep Ordovician drilling, probing into the vast depths of the Anadarko basin, and the daring attack on the northwestern shelf of the basin into the Pennsylvanian and Mississippian rocks.

Far West

THE TOP EXPLORATORY event of the year was the oil discovery by Standard Oil Co. of California on the 5,500-acre offshore parcel at Summerland.

It is developing the area jointly with Humble Oil & Refining Co. The two companies spent close to $12,000,000 on this project before the first well hit pay. Of this amount, $7,250,000 was paid in cash bonus to the state and the balance went for extensive core drilling, and construction of the state's first permanent offshore platform. The Standard discovery tested at a rate of 865 bbl. daily of 36°-gravity crude from an interval at around 7,300 ft.

Just to the south of the Standard-Humble discovery, Richfield Oil Corp. also joined the list of operators drilling from offshore structures with a discovery made from an artificial earth-filled island at Rincon.

Operators started core-drilling operations on several of the 3,840-acre offshore parcels off Santa Barbara County the state awarded last summer for record cash bonuses. Standard, again as operator for itself and Humble, had a mobile platform core drilling on Parcel C off Gaviota in an evaluation program.

Phillips Petroleum Co., as operator for itself and a large group of independent operators and companies, had a floating drilling barge on a similar evaluation program of Parcel A.

Standard and Humble hold two of these leases as does the Phillips Petroleum group. The fifth parcel is leased to The Texas Co.-Monterey Oil Co.-Newmont Oil Co. group with Texaco as operator.

Inland

Until the Standard offshore discovery at Summerland, a midsummer discovery by Richfield Oil Corp. at San Emidio Nose in Kern County was considered the top find in the state. This development resulted from extensive reexamination of more than 30 years of drilling and other work by Richfield as well as others in trying to find production on this southern San Joaquin geological structure.

North Tejon . . . Although it actually dates its discovery back to late 1957, North Tejon field in Kern County stimulated drilling in the area to the extent that several other significant discoveries were made in the immediate vicinity in 1958. Probably the most

Congrats and $25 to Mr. D. J. SUGGS, Republic Natural Gas Co., Tipton Bldg., Pauls Valley, Okla., for this quip.

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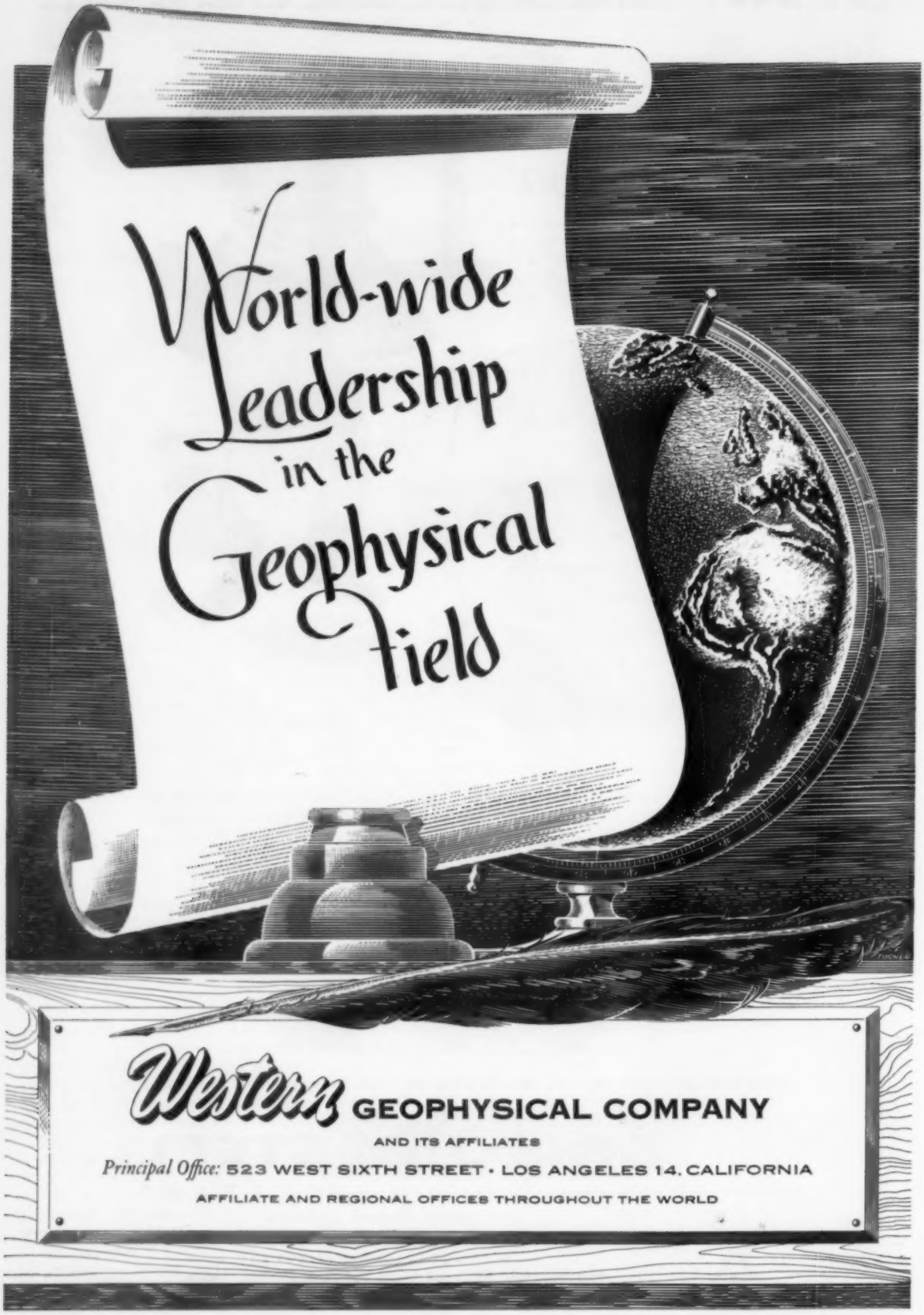

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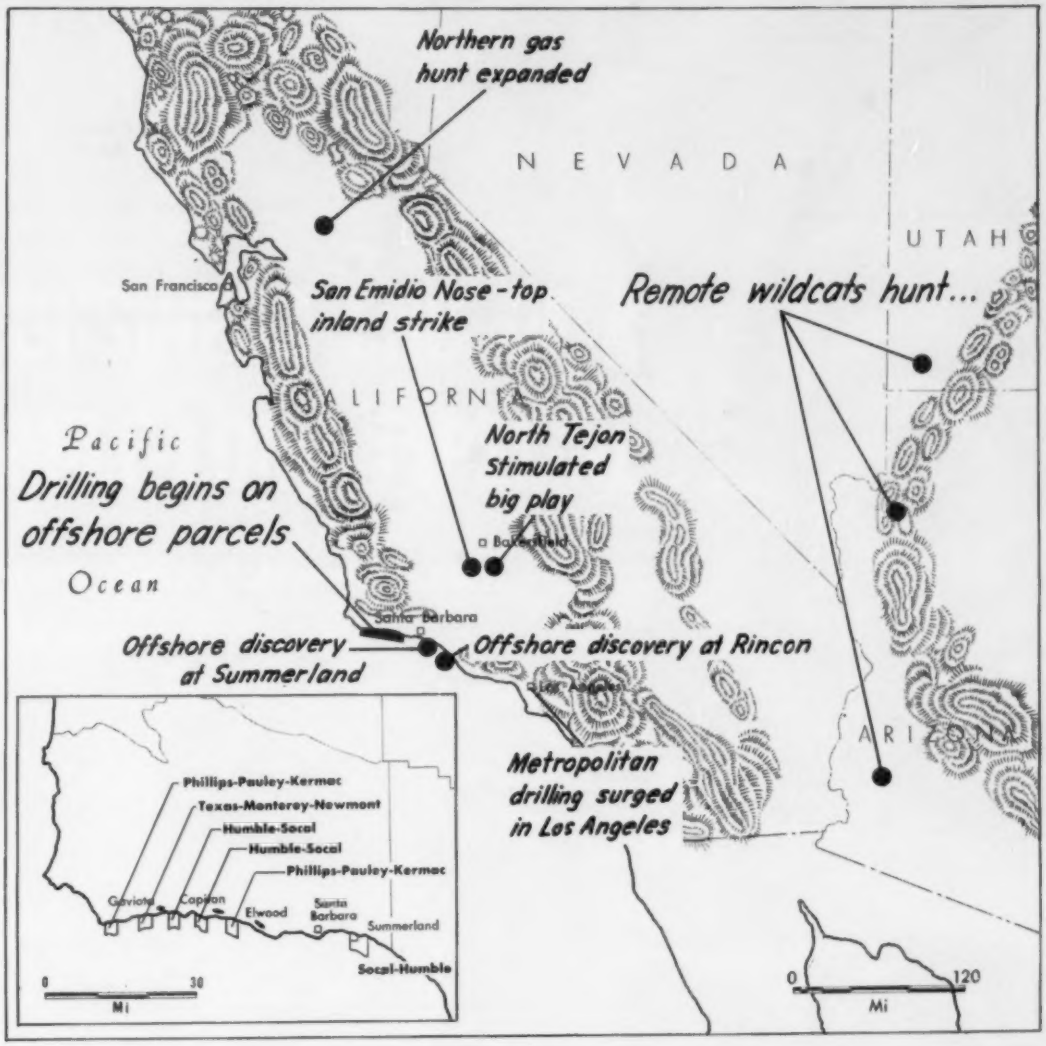


important of these was the one made by Richfield Oil Corp. in the Highway Area of the field about 1 mile west of the Main Area. The Richfield Highway find also led to a deeper Eocene pool discovery to go with the Vedder Miocene production in both the Highway and Main areas at North Tejon.

Los Angeles . . . Exploratory drilling in the Los Angeles Basin was highlighted by the growing number of tests within the metropolitan limits of the city itself.

Southeast

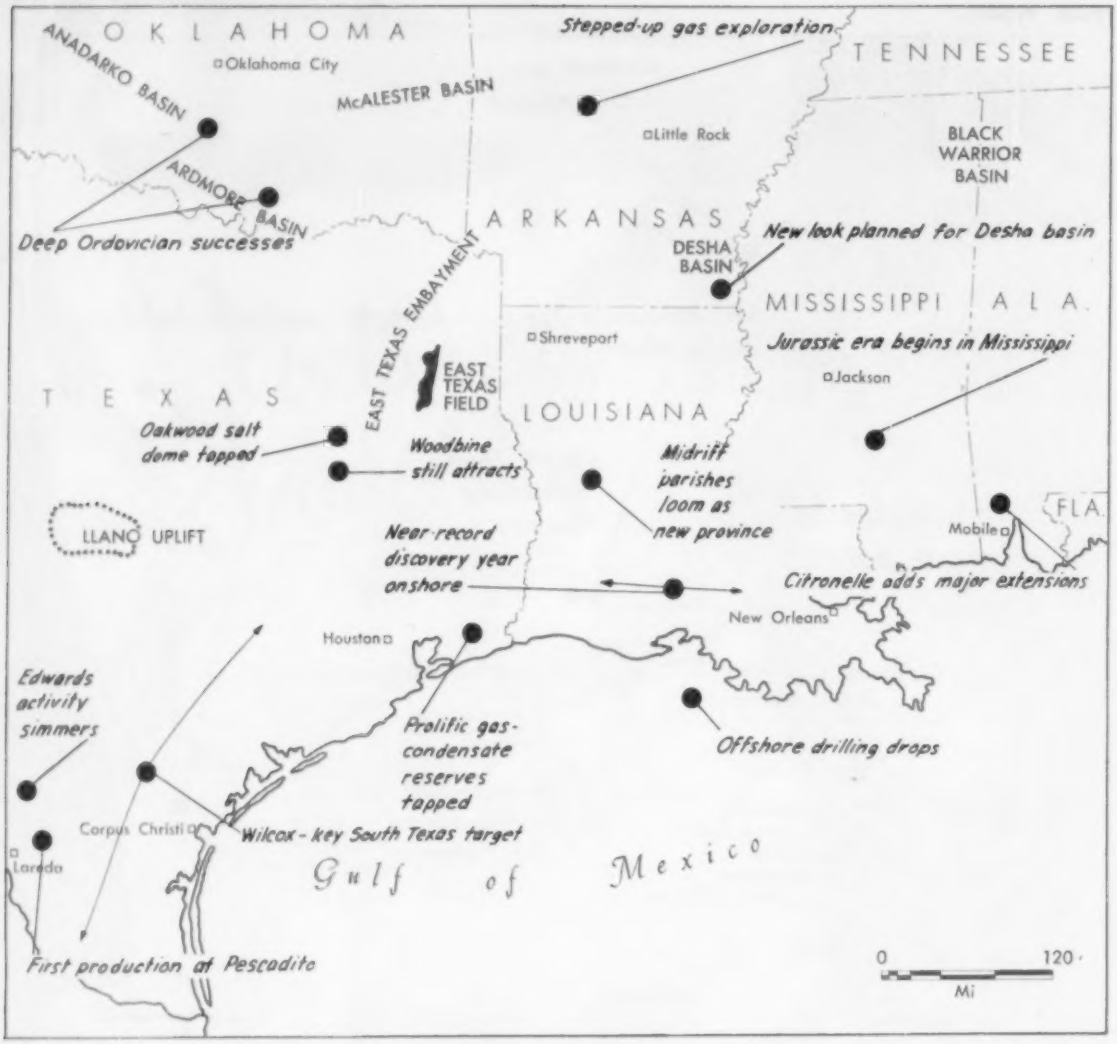
SOUTH LOUISIANA is maintaining its high discovery pace despite the year's slump in drilling activity. Fifty-eight new fields were found in this region during 1958. These exceeded by two the number opened during the more active previous year. They lacked only 8 of tying 1956's record of 66 new-field discoveries.

Discoveries in South Louisiana's offshore areas fell off with only nine new fields opened but the drop there was made up by a significant increase on the landward side of the coast. The 49 onshore discoveries set a new record for that portion of the coastal region. They exceeded by four the 1957 peak.

Two of the offshore fields marked first development in the previously unexplored Marsh Island area, extending off the coast line of Vermilion and St. Mary parishes. Inshore, first production was found on Calcasieu Lake dome, in Calcasieu Lake, Cameron Parish. This was the last of the many known old shallow, piercement-type coastal salt domes to be proved productive. Discovery climaxed the drilling of nearly 40 tests, shallow and deep, over a period of more than 30 years.

New interest is being directed to Louisiana's sparsely explored "mid-riff" belt, separating the coastal and northern regions, following new-field discoveries in Sabine, Rapides, and southern LaSalle parishes.

Discovery and subsequent development of the large-scale, prolific Upper Cretaceous-Tuscaloosa Little Creek field highlighted events in Mississippi although deeper horizons continued the major objective in general exploration over the state. Little Creek, straddling the Lincoln-Pike county line, now has nearly 50 wells with a known productive area 4½ to 5 miles long and more than 2 miles wide. Pay zone is at depths of 10,700 to 10,800 ft.



Continued exploration of deeper horizons in Mississippi during the year accounted for the discovery of at least six additional Lower Cretaceous fields, the state's first Cotton Valley production at Soso, and an indicated Smackover oil strike, also the first for the state. The latter is in a deep wildcat now being tested in Scott County. Earlier during the year, oil showings were encountered in a Smackover test in old Eucutta field, where chief production and development have been in Eutaw-Tuscaloosa sands. A deep wildcat drilled by Carter Oil Co. in northeastern Rankin County found the Smackover productive of carbon dioxide gas, and was chalked off as a failure.

South Texas

GREATEST ACTIVITY in South Texas has been along the Eocene trend. This borders and overlaps to some extent the coastal belt of counties stretching from Webb, Zapata, and Duval counties on the far southwest through the upper coastal region to the Louisiana border.

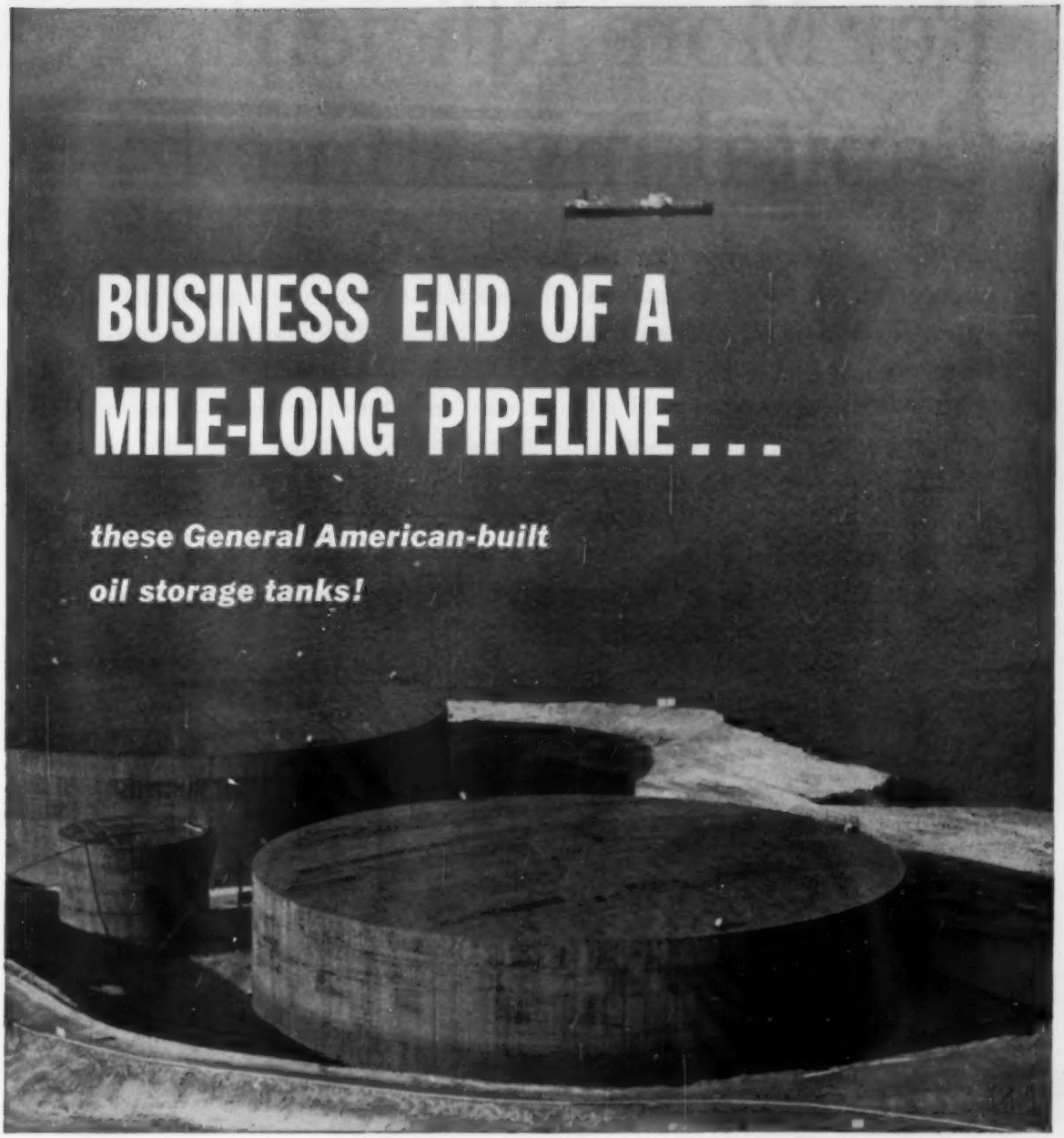
Yegua and Wilcox sands are chief objectives along this trend both in wildcat drilling and deeper exploration in many of the older areas and fields. Duval County, in the far southwest, and Live Oak and Bee counties, in the central area, were particularly active through most of the year and accounted for a succession of discoveries.

In the upper coastal reaches of the trend, a wide area bordering both sides of Tyler and Hardin counties and extending eastward through southern Jasper and Newton counties proved an attractive hunting ground for new Yegua and Wilcox fields.

Discovery of production on the huge Pescadito salt dome in far-southwestern Webb County, was a significant South Texas development. Pescadito, proved a salt dome during the previous year by an ultradeep test, is a prominent geological feature which has teased the wildcatter for many years. Its new production, gas and condensate, is from Wilcox sands, stretching the Eocene play many miles southwestward.

Pescadito also was the scene during the year of the drilling of South Texas' deepest test, a 19,503-ft. hole which encountered exceptionally high temperatures and other complications but failed to find commercial production.

The deep Edwards trend of fields was extended more than 35 miles southwestward by a 9,000-ft. gas discovery in a remote wildcat in sparsely explored northwestern Webb County. It is Webb County's first production below the Eocene-Wilcox sands. Nearest production is the Stuart City deep Edwards field in southwestern La-



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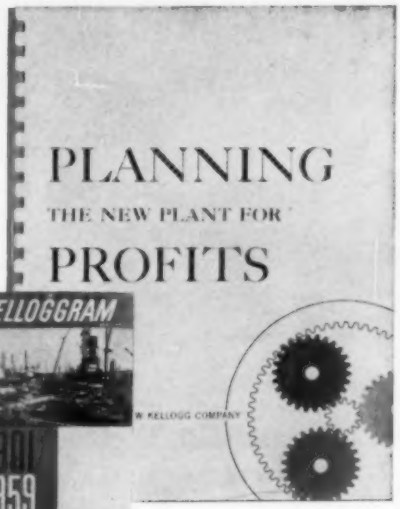

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Salle County. The trend, extending northeastward through LaSalle, McMullen, and Atascosa counties into Karnes County, is beginning to come to life again with several deep wildcats now drilling and new development getting under way in some of the known productive areas. Chief activity during most of the year has been in drilling up the large Fashing field, on the Atascosa-Karnes county line, to supply the gas for the large processing plant being completed in that field.

Exploration in the Gulf of Mexico off the Texas coast was at low ebb most of the year, and only one new field was found. This was an oil discovery by Hunt Oil Co. 2 miles off Jefferson County at a point 7 miles southwest of Sabine Pass.

Development of Frio potentialities in some of the old-line upper Gulf Coast counties, continues to hold up although drilling generally throughout the region has been down. Particular mention should be made of Jefferson and Chambers county, old producing counties in the southeastern corner of the state, where important new oil and gas reserves have been uncovered.

Midwest-Eastern

AN EXPLORATORY TREND that began in 1957 east of the Mississippi River really blossomed in 1958. Big oil and gas events were noted in the Illinois, Michigan, Central Kentucky, and Appalachian basins, as well as in Lake Erie waters.

One of the biggest development stories of the year took place in Green County. A prairie-fire type of oil boom roared through the Bluegrass country near the town of Greensburg. At year's end more than 700 shallow (400-600-ft.) oil wells had been completed in Silurian sand. Daily output from this new field climbed to the 20,000-bbl. mark. A pipeline outlet to the Ohio River showed faith in the field's future.

Illinois basin . . . Illinois and Indiana switched engines in 1958 with an increase in drilling noted on the east side of the Wabash River. However, near the close of the year there was a definite upswing in drilling in Illinois where prolific production was opened near the town of Omaha. Indiana's Spencer County led that state's drilling increase.

Appalachian . . . Drilling in Ohio netted a 72% success ratio as large gas programs got under way. Interest stirred by the Ashtabula County discovery of 1957 grew even warmer in 1958 with record leasing in northeastern Ohio. Deep gas exploration continued brisk in Pennsylvania, New York, and West Virginia.

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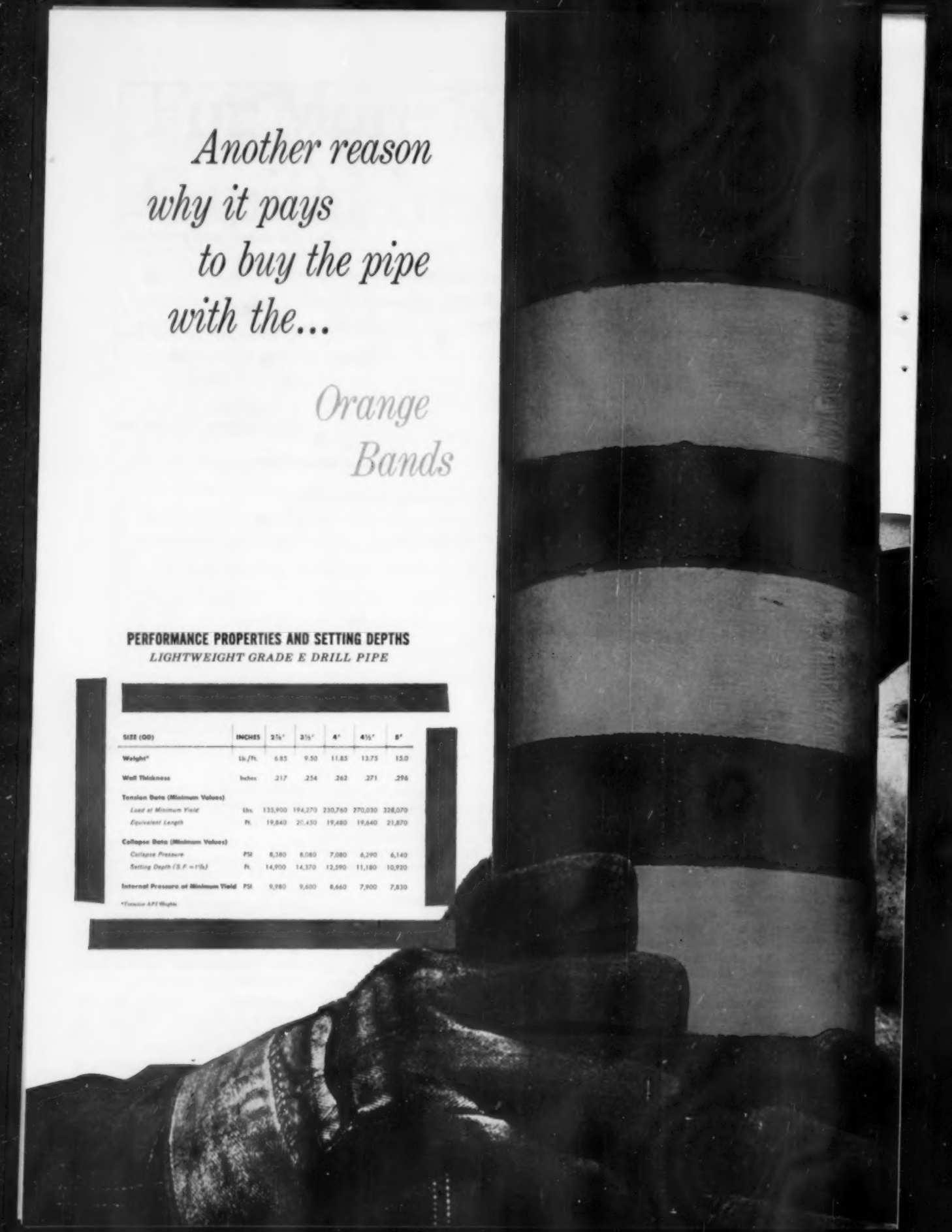
Orange Bands



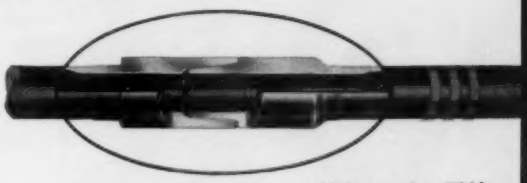
PERFORMANCE PROPERTIES AND SETTING DEPTHS

LIGHTWEIGHT GRADE E DRILL PIPE

SIZE (OD)	INCHES	2⅞"	3½"	4"	4½"	5"
Weight*	Lb./Ft.	6.85	9.50	11.85	13.75	15.0
Wall Thickness	Inches	.217	.254	.262	.271	.296
Tension Data (Minimum Values)						
Load at Minimum Yield	Lbs.	135,900	194,270	230,760	270,030	328,070
Equivalent Length	Ft.	19,840	20,450	19,480	19,640	21,870
Collapse Data (Minimum Values)						
Collapse Pressure	PSI	8,380	8,080	7,080	6,290	6,140
Setting Depth (S.F. = 1⅛)	Ft.	14,900	14,370	12,590	11,180	10,920
Internal Pressure at Minimum Yield	PSI	9,980	9,600	8,660	7,900	7,830

*Tension API Weights

YOUNGSTOWN LIGHTWEIGHT DRILL PIPE



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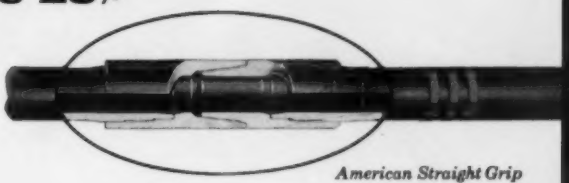
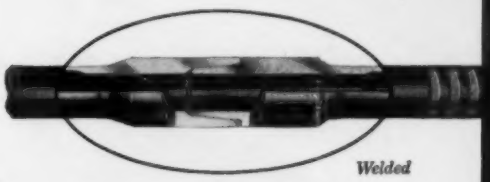
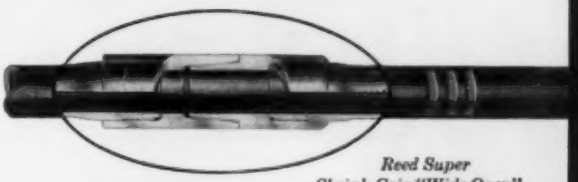


American Straight Grip

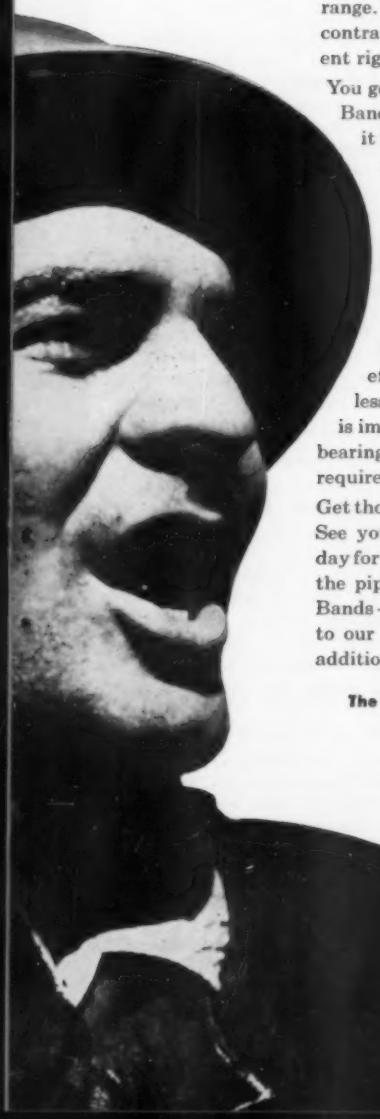


Welded



Reed Super Shrink-Grip "Wide Open"

Hughes Seal Grip



Now, Youngstown provides a lightweight drill pipe that will substantially extend your bidding range. You can bid and *get* those deeper drilling contracts—without any changes in your present rig.

You get more rotating hours with this Orange Band pipe. From ore through final inspection, it is manufactured to rigid drill pipe specifications . . . not a tubing substitute.

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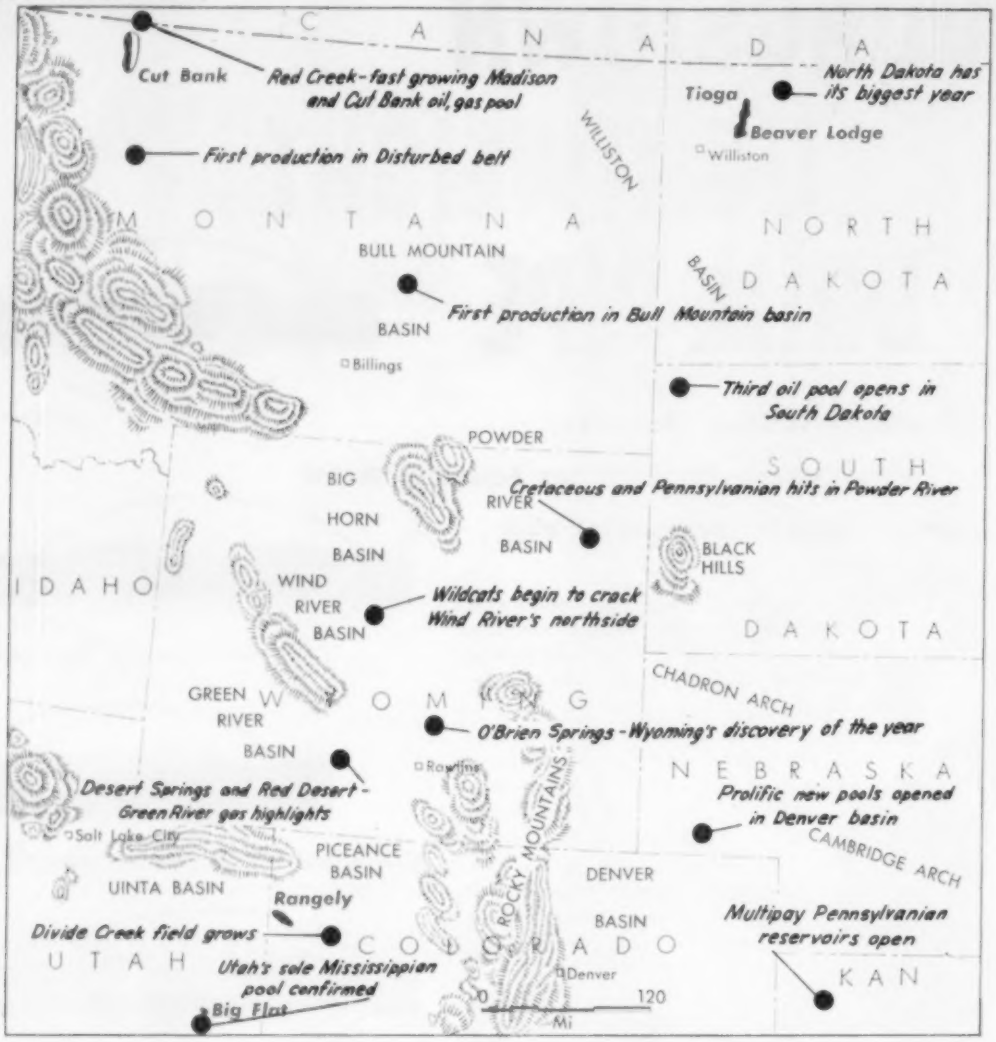
ROCKY MOUNTAINS



big drilling year in the East and on the shores of Lake Erie. Look for a comeback in Illinois drilling, continued brisk searching in Indiana, more shallow oil pools in Kentucky, increased wildcatting in northeastern Ohio and southern Michigan, plus a busy year in the waters off Ontario, Pennsylvania, Ohio, and possibly New York.

Rocky Mountains

SUCCESS continued its reign in Rocky Mountain exploration, but Wyoming stole the show with several important discoveries—Desert Springs, Red Desert, O'Brien Springs, and the Pennsylvanian strikes on the Powder River basin's northeast side.

The Green River basin and its subsidiary bowls, the Red Desert and Hanna basins, came into their own in 1958. Important gas exploration in the Red Desert basin opened promising reserves at Desert Springs and Red Desert, both in remote wildcat country.

The most important discovery of the year in southern Wyoming was O'Brien Springs—a Tensleep oil strike that moved Pennsylvanian production into a virgin territory. The Tensleep strike was part of a new trend of drilling in Wyoming—toward the deeper horizons. This Pennsylvanian push is best illustrated by the new pools opened in the Donkey Creek area of the Powder River basin. Minnelusa production was opened east and west of this field, setting off a flurry of interest in Pennsylvanian rocks in an area of shallower production.

Other Rocky Events

Widespread discoveries of note occurred in the Las Animas arch country of northwestern Kansas, the Denver basin, Piceance Creek basin, Bull Mountain and Central Montana basins, in the Disturbed belt of Montana, the Williston basin, and near Cut Bank field.

. . . Northwest Kansas. The extreme corner of Kansas is a new Pennsylvanian oil reservoir. Four important finds in Sherman, Cheyenne, and Rawlins counties give an inkling of what is in store for the Las Animas arch in the near future. Multipay fields in Kansas are the key to what may become a major province in a short time.

Williston basin . . . North Dakota drilling had its biggest year yet with more wells completed than ever before. Most of the new strikes were in the northeastern sector, but deeper pre-Madison fields appeared near the Nesson anticline. South Dakota got its third oil pool.

The Disturbed belt gained its first commercial production at Blackleaf. A shallow Madison and Cut Bank field

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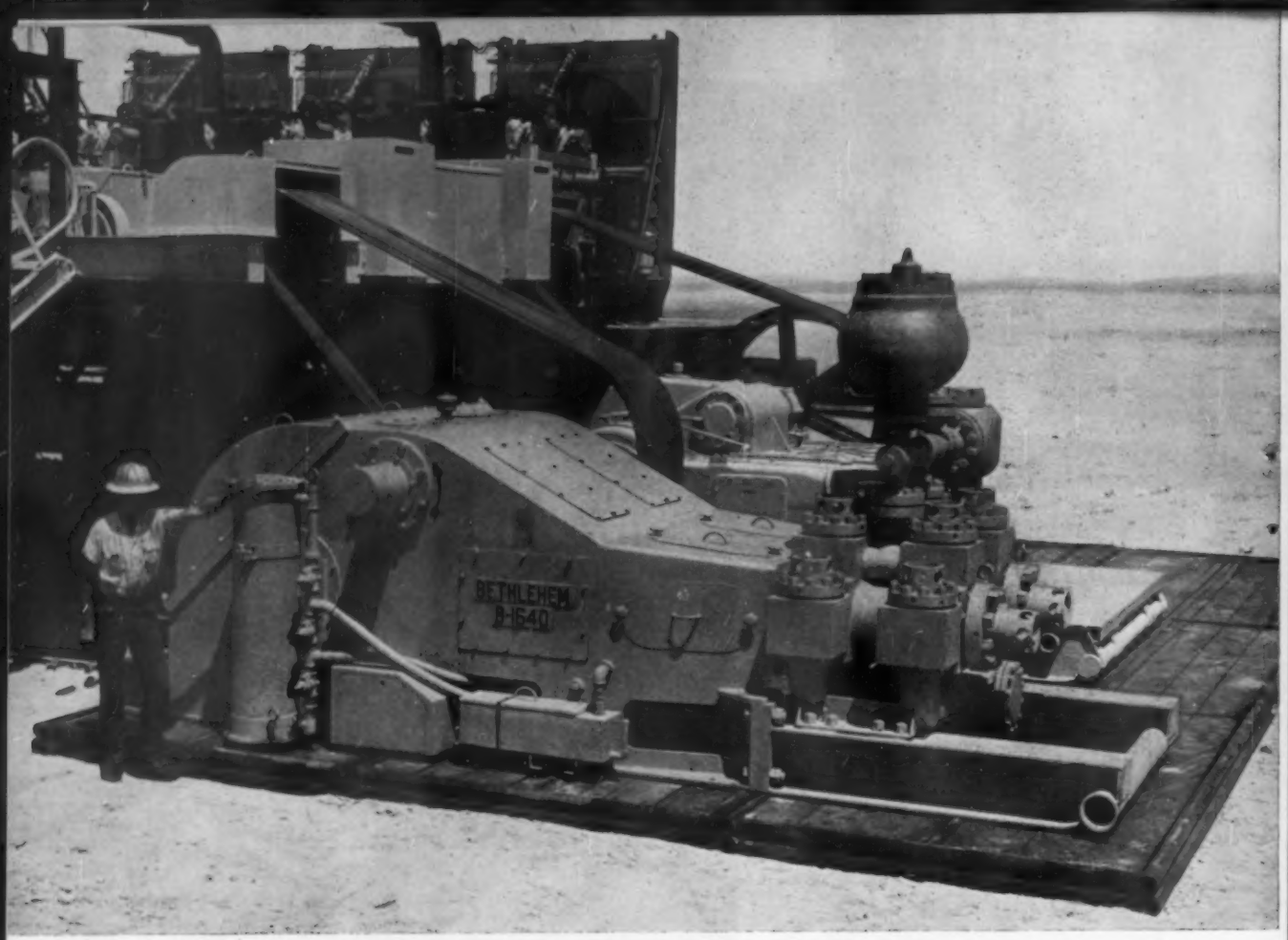

THE B-1640 *gets more horsepower to the bit than any other pump ever offered!*

Bethlehem's B-1640 is the first pump with enough horsepower to measurably increase rates of penetration in deepest drilling. This huge slush pump gets more actual horsepower to the *bit*—thereby speeding up drilling, and saving wear and tear on the bit itself.

The B-1640 eliminates the need for parallel or series operation. It is big enough—strong enough—to do the job alone. The fluid end is an assembly of interchangeable units made of forged steel. Suction and discharge manifolds are forged-steel fittings, stress-relieved and tested. The power-end frame is an all-steel weldment with double-side-plate construction. Gears and shafts are alloy-steel forgings. High-capacity roller bearings support all rotating loads.

In power, reserve, and economy of operation, the B-1640 leads the field. Call or write for complete information.

B-1640 Performance Data

Max volume (gpm) . . . Max pressure (psi) . . . Max input hp (ihp)
(Based on 100 pct volumetric and 85 pct mechanical efficiencies)

Liner sizes, in.		8	7½	7	6½	6
Vol. per crank rev., gal		12.59	10.91	9.33	7.86	6.50
Crank rpm						
50	gpm	630	546	467	393	325
	psi	2,570	2,920	3,360	3,900	4,570
	ihp	1,111	1,093	1,076	1,052	1,020
60	gpm	755	655	560	472	390
	psi	2,570	2,920	3,360	3,900	4,570
	ihp	1,333	1,312	1,291	1,262	1,223
70	gpm	881	764	653	550	455
	psi	2,570	2,920	3,360	3,900	4,570
	ihp	1,555	1,530	1,506	1,473	1,427
80	gpm	1,007	873	764	629	520
	psi	2,570	2,920	3,360	3,900	4,570
	ihp	1,777	1,749	1,722	1,683	1,631
90	gpm	1,133	982	840	707	585
	psi	2,570	2,920	3,360	3,900	4,570
	ihp	1,999	1,967	1,937	1,894	1,835

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WESTERN CANADA

at Red Creek grew into a sizeable producing area near the Canadian border. First production was opened inside the Bull Mountain basin, and an Amsden strike near Sumatra returned interest to that formation on the Central Plains.

The year ahead . . . Exploratory events happen so thick and fast in the Rockies that it is hard to predict what lies ahead. There are several definite trends developing, however. The Las Animas arch will see a big splurge of wildcatting . . . more tests will go down in the Disturbed belt . . . More gas searching is in store for the Green River basin . . . The Pennsylvanian will be the topic of drilling conversation at Powder River and Hanna.

West Canada

WESTERN CANADA'S exploration in 1958 was summed up in three words—reefs, Middle Devonian, and gas. The statistics didn't show it, but that was perhaps Canada's most significant wildcat year. Depth records were broken, vast oil and gas reserves opened, and forbidding wildcat frontiers cracked.

The gas story . . . Canada's biggest single gas well and deepest producer was completed at Berland River. British American's famed wildcat flowed more than 1½ billion cubic feet of gas from Devonian D3 reef at 12,179 ft. This is the biggest single gas well in the country, and one of the few such gassers in the world. The 663 ft. of reef pay is also a record for Canada.

. . . Waterton Park. This far southwestern Alberta gas giant became the country's largest potential gas reserve with prolific production from Mississippian rocks. The success at Waterton Park fired the already busy Foothills gas play that is sweeping up the length of the Canadian Rockies.

Other gas reserves of importance were opened in the Grande Prairie region and in northeastern British Columbia. Dick Lake field also grew into a gigantic gas field.

The reefs . . . Devonian reefs paid as never before in Alberta in 1958. Both gas and oil reserves were found in these thick traps, the most noteworthy being Berland River, Panther Creek, Simonette River (the country's deepest hole at 15,283 ft.), and the Simonette D3 oil discovery nearby, the year's best oil find.

Swan Hills . . . The prime objective for exploration in Alberta is the Middle Devonian Beaverhill Lake section. Swan Hills appears to be the most prolific find in Canada since Pembina, holding even more promise for the future than that giant. The vast oil space shaping up from Kaybob on the southwest to Swan Hills on the northeast, Red Earth Creek on the far north and North Whitecourt on the south seemingly has no end. A large development program is planned at Swan Hills this winter. Kaybob is already developing at a fast clip. Oil was found in the Beaverhill Lake zone at Red Earth Creek and Girouxville during the year, creating more interest.

★ DRILLING—12-YEAR RECORD

Total well completions drop 4,727 in '58

	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
Alabama	29	21	19	43	50	72	103	63	41	91	78	76
Arkansas	329	301	322	407	429	427	573	665	804	1,002	1,114	836
California	2,053	2,876	2,512	1,829	2,361	2,433	2,578	2,353	2,465	2,306	2,238	1,476
Colorado	209	207	82	99	289	486	734	1,358	1,509	1,222	855	836
Florida	35	26	24	13	2	10	30	31	30	13	9	7
Illinois	2,033	2,438	2,711	2,823	2,424	2,149	2,165	3,135	3,892	3,808	2,686	2,419
Indiana	681	1,082	1,279	1,534	1,369	1,277	1,280	887	706	741	754	877
Kansas	2,694	3,284	3,387	4,010	4,501	4,571	4,783	4,722	4,958	4,941	4,232	4,022
Kentucky	660	908	1,047	1,150	1,309	1,300	1,164	1,188	1,592	1,936	1,495	2,137
Louisiana	1,626	2,325	2,371	2,453	2,240	2,385	2,828	3,611	4,019	3,875	3,856	3,523
Michigan	909	895	995	897	746	707	623	567	512	437	455	436
Mississippi	491	428	334	313	375	348	397	441	448	441	386	398
Missouri	....	....	....	27	18	18	10	39	1	34	8	6
Montana	309	345	279	270	262	345	451	343	411	495	433	338
Nebraska	7	62	49	171	241	291	320	472	891	918	886	728
New Mexico	562	606	501	607	773	1,053	1,418	1,126	1,663	1,904	2,129	1,910
New York	1,531	1,344	882	657	627	767	696	435	378	512	443	544
North Dakota	....	....	....	3	12	122	270	312	250	263	316	442
Ohio	1,377	1,393	1,084	1,027	971	1,052	1,080	1,182	1,259	1,086	1,115	1,049
Oklahoma	3,846	4,293	4,352	5,459	5,626	5,781	7,593	8,786	8,411	8,056	6,235	6,354
Pennsylvania	3,238	3,159	1,920	1,581	1,738	1,884	1,507	1,331	717	748	833	652
South Dakota	(*)	(*)	(*)	12	1	14	20	23	16	9	44	15
Texas	9,301	12,251	13,665	16,585	16,655	16,845	17,019	18,865	19,981	21,519	21,352	18,065
Utah	4	18	49	17	39	79	70	91	92	141	267	383
West Virginia	882	846	518	652	622	606	618	614	640	693	680	756
Wyoming	267	584	587	615	745	700	917	1,221	915	930	863	762
Miscellaneous	49	86	69	25	91	99	32	69	81	39	76	64
Total U. S.	33,122	39,778	39,038	43,279	44,516	45,821	49,279	53,930	56,682	58,160	53,838	49,111

*Included in miscellaneous.

. . . with wildcats accounting for 2,151 of the loss

	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
Alabama	23	19	14	20	21	40	75	56	40	30	28	30
Arkansas	65	97	78	100	99	97	140	157	210	190	25	163
California	359	492	487	450	551	597	666	572	530	527	527	368
Colorado	51	46	48	56	143	245	364	657	811	675	550	485
Florida	27	23	19	10	2	10	30	30	29	13	9	7
Illinois	521	622	724	870	873	656	425	461	635	772	628	449
Indiana	156	327	471	510	559	424	373	224	261	145	155	307
Kansas	412	510	522	816	1,006	845	887	811	1,018	1,073	849	844
Kentucky	93	139	169	214	293	306	213	173	399	440	310	176
Louisiana	278	310	281	302	379	401	513	570	695	778	679	531
North	136	119	106	136	210	195	177	214	242	265	211	243
South	142	191	175	166	169	206	336	356	453	513	468	288
Michigan	275	313	344	338	332	277	279	243	212	168	152	145
Mississippi	94	108	115	130	174	182	207	178	182	220	194	174
Montana	42	30	45	49	50	98	126	123	172	195	185	136
Nebraska	7	30	18	82	134	168	161	185	415	451	474	348
New Mexico	47	71	74	79	105	165	168	156	158	278	267	266
North Dakota	....	....	....	3	12	36	91	117	69	78	149	135
Ohio	51	52	37	19	35	41	22	22	27	13	15	23
Oklahoma	843	831	804	840	830	730	742	859	832	867	747	854
Pennsylvania	21	24	6	4	10	20	20	46	16	19	18	26
South Dakota	(*)	(*)	(*)	12	1	14	20	22	16	9	44	15
Texas	1,895	2,568	2,791	3,443	4,408	4,851	5,245	5,190	5,124	5,610	5,004	3,636
N. Central (9)	330	429	475	607	862	1,048	1,058	1,131	975	1,115	1,089	573
W. Central (7-B)	276	469	592	729	1,019	1,035	1,062	971	1,035	1,075	973	699
West (7-C and 8)	213	314	343	669	844	870	876	938	839	898	872	706
Panhandle (10)	15	15	19	24	36	80	26	94	65	125	113	126
East (5 and 6)	137	142	186	223	255	252	300	334	367	431	387	332
Gulf Coast (2)	380	500	450	480	299	336	369	312	344	308	255	196
Gulf Coast (3)	37	79	81	83	363	390	519	526	517	562	440	286
Southwest (1)	107	80	95	98	249	348	432	385	481	498	431	367
Southwest (4)	400	540	550	530	481	492	603	499	501	598	444	351
Utah	4	18	19	13	32	50	42	65	71	86	121	84
West Virginia	104	82	24	43	17	14	23	51	30	27	33	22
Wyoming	67	104	131	122	141	173	189	271	262	289	310	259
Miscellaneous	26	61	73	29	95	112	41	41	57	81	266	105
Total U. S.	5,461	6,877	7,294	8,554	10,302	10,552	11,062	11,280	12,271	13,034	11,739	9,588

*Included in miscellaneous.

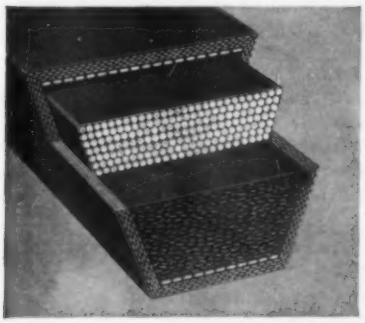
BOSTON Helps Set World Depth Record

History-making wildcat has used same BOSTON V-Belts since spudding-in in 1956. Belts look good for another 25,000 ft.

When the Phillips Petroleum Company's famous well, the University EE-1 in Pecos County, Texas, surpassed the former drilling-depth record in May, the crew had mastered a fair share of trouble . . . including a whipstock at a record depth of nearly 20,000 ft. And since then, they have set new records in length of casing . . . depth of pipe . . . total column of cement. And as of early September, they were still making hole.

Throughout this whole record-breaking performance, the same set of BOSTON V-Belts has been on the job driving the mud pumps . . . completely trouble-free, and looking as if they could go another 25,000 ft. They went to 17,500 without a take-up, and were re-set then only because bigger pumps were installed.

This whole remarkable achievement tells a lot about the men and the equipment on the job. And a closer look at the belts



involved will show exactly why they have played their part so well.

They were made by Boston Woven Hose and Rubber Company — a part of their standard line, which features every advanced development in the industry. The tensile members are Dacron* . . . with a moisture regain only 1/20th that of conventional reinforcing fibres, giving tremendous stability through humidity changes . . . 40% stronger than conventional tensile fibers . . . and put through a special heat and tensioning process for even greater stretch resistance.

To provide necessary resistance to oils, heat, abrasion, chemicals and ozone, BOSTON V-Belts are made with Neoprene. And the Fiber-Dispersed stock provides high cross-wise rigidity, exceptional length-wise flexibility, and extra support for the tensile members during shock-load impact and during normal operation.

With new BOSTON Multiple V-Belts you, too, can cut down maintenance, save matching and take-up time, and reduce your V-Belt inventory. Remember, for industrial rubber products . . . including all types of hose and belting . . . BOSTON serves you best. For more information, write:

Record Phillips' well approached 25,500 ft. in September

*DuPont polyester fiber

BOSTON

BOSTON WOVEN HOSE & RUBBER CO.
DIV. OF AMERICAN BILTRITE RUBBER CO., INC.
BOSTON 3, MASS.

★ DRILLING—12-YEAR RECORD

'58 footage skids to below 1953's figure

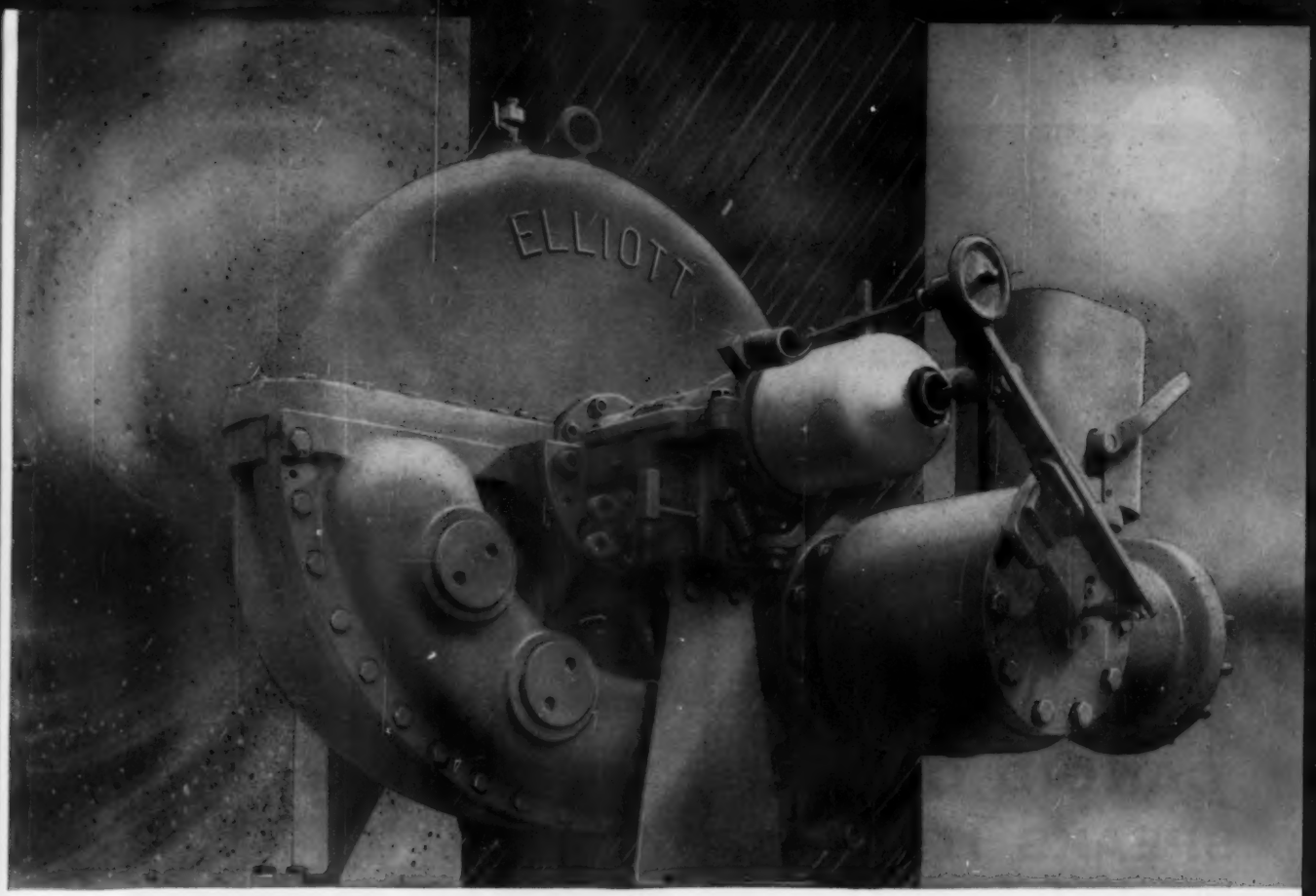
(Thousands of feet)

	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
Arkansas	1,409	1,270	1,283	1,342	1,522	1,589	2,111	2,400	2,629	3,005	3,389	2,787
California	8,764	10,579	10,443	7,966	9,566	10,313	11,355	10,923	12,724	10,566	9,786	7,178
Colorado	1,151	1,228	359	409	1,425	2,580	3,830	7,412	8,103	6,232	4,477	4,352
Illinois	5,251	6,386	6,362	6,311	6,044	5,312	5,425	7,613	9,303	8,771	6,198	5,494
Indiana	1,206	2,023	2,357	2,642	2,455	2,255	2,102	1,380	1,103	1,243	1,301	1,406
Kansas	8,690	10,634	10,715	12,744	15,035	15,520	16,217	16,328	17,597	17,103	15,272	14,065
Kentucky	1,194	1,515	1,853	2,076	2,412	2,568	2,355	2,284	2,372	2,748	2,167	2,385
Louisiana	8,709	10,934	12,477	14,554	14,189	15,662	19,125	21,987	26,085	28,438	29,998	27,024
North	2,912	4,128	4,453	4,626	4,741	4,815	4,530	5,923	6,460	6,083	5,285	4,970
South	5,797	6,806	8,024	9,928	9,448	10,847	14,595	16,064	19,625	22,355	24,713	22,054
Michigan	1,935	1,983	2,209	2,118	1,860	1,808	1,603	1,542	1,522	1,262	1,316	1,202
Mississippi	4,131	3,312	2,388	2,258	2,539	2,441	2,750	3,162	3,339	3,193	2,934	3,561
Montana	630	819	650	621	640	1,257	1,933	1,473	1,928	2,440	2,100	1,732
New Mexico	2,512	2,602	2,419	2,747	3,777	5,833	8,017	6,161	7,046	8,458	9,980	8,869
N. Y., Pa., and W. Va.	9,702	9,293	5,835	5,381	5,800	6,512	5,662	6,691	3,993	4,439	5,026	4,841
North Dakota	....	....	....	27	65	1,002	1,962	2,246	1,774	1,977	2,157	2,840
Ohio	3,913	3,498	2,286	2,172	2,057	2,295	2,274	2,391	2,642	2,583	2,689	2,708
Oklahoma	12,151	15,515	15,339	19,865	20,542	21,621	26,122	29,463	27,532	27,821	21,595	21,013
Texas	41,029	52,746	57,462	71,975	76,777	82,451	78,645	85,185	85,984	92,620	89,840	74,885
N. Central (7-B and 9)	8,544	11,312	12,831	14,513	16,017	18,688	21,958	22,484	22,982	23,396	21,410	16,964
West (7-C and 8)	10,809	15,428	16,398	26,543	28,233	29,389	20,318	25,144	26,560	28,644	29,549	24,979
Panhandle (10)	1,593	2,053	3,015	2,804	2,307	2,123	2,555	3,211	3,720	5,202	5,639	5,762
East (5 and 6)	3,070	3,383	4,992	4,928	5,603	4,455	4,209	5,590	4,884	5,682	6,685	5,557
Gulf Coast (2 and 3)	9,559	11,995	11,880	13,706	14,328	16,968	16,361	17,245	16,034	17,452	15,846	13,170
Southwest (1 and 4)	7,454	8,575	8,346	9,481	10,289	10,828	13,244	11,511	11,804	12,224	10,711	8,453
South Dakota	(*)	(*)	(*)	30	3	48	103	108	64	48	158	48
Wyoming	1,203	2,501	2,803	2,994	3,789	3,529	4,337	6,537	4,484	3,966	3,848	3,599
Miscellaneous	481	554	763	1,056	1,834	2,594	2,911	3,700	6,046	6,989	7,669	7,395
Total U. S.	114,061	137,392	138,003	159,288	172,331	187,190	198,839	218,986	226,270	233,902	221,900	197,384

*Included in miscellaneous.

. . . and average footage also shows a drop

	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
Alabama	4,146	5,260	4,657	4,368	5,380	5,722	5,257	5,221	4,878	8,789	9,316	8,566
Arkansas	4,282	4,218	3,984	3,296	3,549	3,721	3,684	3,609	3,270	2,997	3,042	3,333
California	4,269	3,678	4,157	4,356	4,052	4,239	4,443	4,642	5,162	4,581	4,373	4,863
Colorado	5,507	5,932	4,378	4,132	4,929	5,309	5,218	5,458	5,370	5,100	5,587	5,205
Florida	6,182	5,939	7,529	5,893	10,047	6,256	6,517	6,406	6,638	6,984	6,403	9,671
Illinois	2,583	2,620	2,347	2,236	2,493	2,472	2,506	2,428	2,390	2,303	2,308	2,271
Indiana	1,771	1,870	1,843	1,722	1,793	1,766	1,642	1,556	1,563	1,678	1,725	1,603
Kansas	3,226	3,238	3,459	3,178	3,340	3,395	3,391	3,458	3,459	3,462	3,609	3,497
Kentucky	1,810	1,668	1,770	1,805	1,842	1,976	2,033	1,922	1,490	1,419	1,450	1,116
Louisiana	5,357	4,703	5,262	5,933	6,334	6,567	6,763	6,064	6,490	7,339	7,779	7,671
Michigan	2,129	2,215	2,220	2,362	2,494	2,557	2,573	2,720	2,973	2,889	2,893	2,758
Mississippi	8,416	7,738	7,150	7,214	6,771	7,013	6,926	7,170	7,453	7,241	7,602	8,946
Montana	2,038	2,375	2,328	2,301	2,443	3,643	4,287	4,295	4,691	4,930	4,851	5,125
Nebraska, Missouri	1,689	709	2,240	3,191	4,083	4,447	5,039	5,137	5,603	5,490	5,826	5,883
New Mexico	4,470	4,293	4,828	4,526	4,886	5,539	5,654	5,471	4,237	4,443	4,687	4,644
New York	1,439	1,438	1,434	1,437	1,440	1,369	1,447	1,446	1,460	1,465	1,107	1,533
North Dakota	....	....	....	9,038	5,425	8,213	7,267	7,200	7,096	7,518	6,827	6,425
Ohio	2,842	2,511	2,110	2,115	2,119	2,181	2,105	2,023	2,098	2,378	2,412	2,582
Oklahoma	3,159	3,614	3,525	3,639	3,651	3,740	3,440	3,553	3,273	3,453	3,463	3,307
Pennsylvania	1,578	1,636	1,605	1,717	1,800	1,971	1,977	3,273	2,534	2,436	3,190	3,011
Texas	4,411	4,305	4,205	4,340	4,601	4,301	4,626	4,516	4,303	4,304	4,207	4,145
Utah	6,713	4,140	5,001	4,069	5,473	6,395	5,653	4,139	4,314	4,893	5,423	5,618
West Virginia	2,707	2,592	2,873	2,643	2,844	2,887	2,710	2,776	2,505	2,694	2,751	2,704
Wyoming	4,506	4,282	4,775	4,869	5,086	5,042	4,730	5,354	4,901	4,265	4,458	4,724
Miscellaneous	2,884	1,986	1,933	3,221	3,035	2,624	2,886	2,966	3,078	4,771	4,470	3,202
Total U. S.	3,445	3,454	3,538	3,680	3,871	4,085	4,035	4,061	3,992	4,022	4,122	4,019

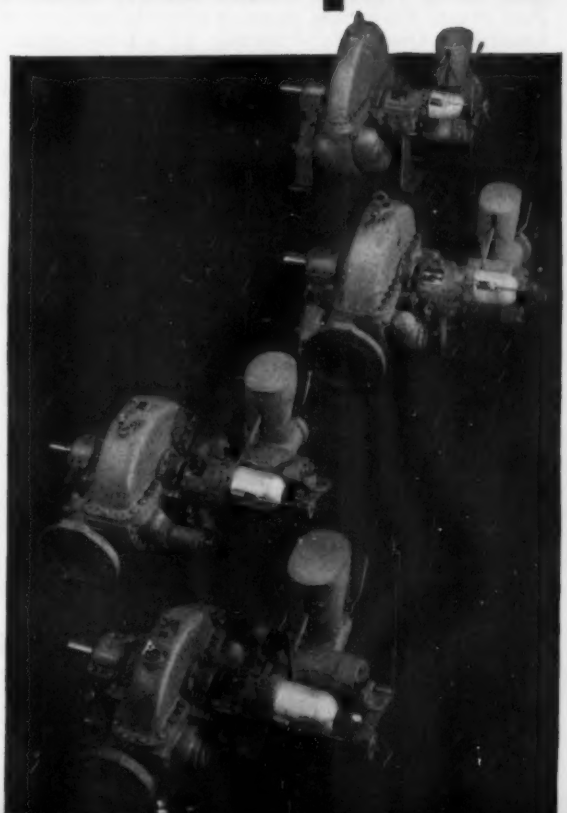


rugged and weatherproof

ELLIOTT YR TURBINES

Desert heat, arctic cold, driving rain and swirling dust don't faze rugged, dependable Elliott YR Turbines. Tightly sealed against dust, fumes and moisture . . . built strong and husky . . . these machines make dependable, economical drives for pumps, compressors, fans, line shafts, generators and other equipment.

The governor is simple and reliable, and is available in several modifications to match speed and pressure control requirements. YR turbines are designed for easy installation and service. Many key parts are interchangeable for various frame sizes. Four sizes are shown at the right. Write for descriptive bulletin H22-C.



In addition to the units illustrated here, Elliott makes single-stage turbines in special frames, reduction gears, multistage mechanical drive turbines to 50,000 hp, and turbine-generators through 44 mw.

TURBINES FOR DEPENDABLE day-in/day-out SERVICE

ELLIOTT Company

JEANNETTE, PENNSYLVANIA H9-2

Typical of the sort of super service station BP is building across the two provinces, this BP garage stands at the corner of Ontario and Leclaire Streets in down-town Montreal. Says 42-year-old owner WILLY SWEET (cleaning windscreen) – "It's a darn nice outfit, BP. Sales? I was up 4,000 gallons first month I took over."

CANDID CANADA SPEAKS ITS MIND

It was only in April 1957 that the first gallon of BP gasoline was sold in Canada.

Today BP Canada Limited (an affiliate of the international British Petroleum Company Limited) operates a chain of over 350 garages, spanning across the provinces of Ontario and Quebec. Later this year, BP will have around 700 garages. And by 1960, a great new BP Refinery will be in operation at Ville d'Anjou. Recently a special reporter was sent from London to find out what Canadians think of BP's great new development.

What the motorists think, you can read on this page. They think BP's good. But what of the men who sell it? For this, come to the BP Don Mills service station, Toronto City. Here works expatriate Britisher Mr. W. R. Matthews. He used to sell BP in England. Now he sells it in Canada. And what does he think? "Sir," he said to the BP reporter, "the future of BP in Canada? The answer is WOW!"

Driver of a British Ford Anglia, 74-year-old SAM DIAMOND of Ottawa. "I find BP 100%. Been using it for about a month now and yes sir, I find everything about BP just fine."

Out for a weekend trip with his wife and 7-year-old daughter Marilyn, DONALD MORRISON of 28 Greenland Road, Don Mills. "I always use BP, it sure is OK by me."

28-year-old VIC ORTIZ of 4 Hollywell Drive, Toronto City, drives Ford Fairlane 235-774, is himself in the automobile business: "It's real fine gas is BP. As for service, I reckon they give the best you'll find in the city."

Pipe Line Spread Boss, 37-year-old WILLIAM BERNARD of 74 Jackman Avenue, Toronto. "I always use BP and I find it works real good. I reckon British goods are just fine."

THE BRITISH PETROLEUM COMPANY LIMITED

BP

Well tally—county, results, footage

ALABAMA
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Baldwin	4	0	0	0	4	32,227
Blount	1	0	0	0	1	1,700
Choctaw	1	0	0	0	1	3,982
Clarke	2	0	0	0	2	9,962
Fayette	2	0	0	0	2	1,805
Franklin	2	0	0	0	2	3,014
Lauderdale	1	0	0	0	1	1,537
Lawrence	4	0	0	0	4	2,796
Marion	4	0	0	0	4	7,317
Mobile	4	1	0	0	3	49,373
Walker	0	0	0	0	0	*30
Washington	1	0	0	0	1	7,528
Wilcox	1	0	0	0	1	5,449
Winston	3	0	0	0	3	5,409
Total	30	1	0	0	29	132,129

*Additional footage of one old well drilled deeper.

ALABAMA
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Baldwin	2	2	0	0	0	0	10,920
Mobile	44	44	0	0	0	0	508,004
Total	46	46	0	0	0	0	518,924

ARIZONA
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Apache	6	1	0	0	5	22,593
Cochise	4	0	0	0	4	12,257
Mohave	6	0	0	0	6	15,265
Navajo	2	0	0	0	2	2,163
Yuma	1	0	0	0	1	2,006
Total	19	1	0	0	18	54,284

ARKANSAS
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Boone	2	0	0	0	2	5,148
Bradley	3	0	0	0	3	14,082
Calhoun	4	0	0	0	4	12,431
Columbia	12	1	0	0	11	65,233
Conway	1	0	0	1	0	2,896
Crawford	1	0	0	1	0	6,478
Crittenden	1	0	0	0	1	3,474
Drew	1	0	0	0	1	4,275
Faulkner	1	0	0	0	1	4,002
Hemstead	3	0	0	0	3	13,544
Howard	3	0	0	0	3	4,535
Johnson	4	0	0	3	1	21,693
Lafayette	34	6	3	0	25	159,746
Logan	6	0	0	3	3	46,016
Miller	16	1	0	2	13	77,027
Nevada	20	1	0	0	19	54,229
Ouachita	9	1	0	0	8	32,091
Prairie	1	0	0	0	1	12,000
Scott	1	0	0	0	1	2,508
Sebastian	1	0	0	1	0	5,536
Union	33	2	0	0	31	115,280
Van Buren	1	0	0	0	1	3,016
Washington	2	0	0	0	2	2,501
White	3	0	0	0	3	9,371
Total	163	12	3	11	137	677,112

ARKANSAS
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Columbia	82	64	0	0	17	1	258,252
Conway	4	0	0	2	2	0	9,653
Crawford	1	0	0	1	0	0	5,997
Franklin	7	0	0	7	0	0	40,712
Johnson	3	0	0	2	1	0	12,154
Miller	38	14	0	3	21	0	168,341
Nevada	44	28	0	0	16	0	99,558
Lafayette	63	27	0	0	34	2	284,955
Logan	1	0	0	0	1	0	6,000
Ouachita	115	94	0	0	21	0	294,878
Pope	2	0	0	1	1	0	9,354
Sebastian	8	0	0	8	0	0	52,595
Stephens	2	1	0	0	1	0	4,840
Union	303	215	0	2	86	0	862,344
Total	673	443	0	26	201	3	2,109,611

CALIFORNIA
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Butte	8	0	0	0	8	28,701
Colusa	10	0	0	1	9	54,425
Contra Costa	4	0	0	1	3	12,385
Fresno	13	0	0	0	13	61,797
Glenn	8	0	0	0	8	56,106
Imperial	1	0	0	0	1	4,740
Kern	107	18	0	0	89	654,887
Kings	13	1	0	0	12	58,183
Los Angeles	31	5	0	0	26	168,217
Madera	3	0	0	0	3	14,496
Merced	1	0	0	0	1	9,001
Monterey	19	1	0	0	18	51,903
Orange	5	1	0	0	4	19,269
Riverside	2	0	0	0	2	4,738
Sacramento	3	0	0	3	0	24,144
Santa Barbara	18	1	0	1	16	83,883
San Benito	10	2	0	0	8	34,803
San Bernardino	7	0	0	0	7	12,681
San Joaquin	9	0	0	3	6	47,719
San Luis Obispo	18	0	0	0	18	78,631
Santa Cruz	2	0	0	0	2	5,233
San Mateo	10	2	0	0	8	32,993
Solano	6	0	0	0	6	33,245
Sonoma	5	0	0	1	4	4,678
Stanislaus	2	0	0	0	2	9,980
Sutter	1	0	0	0	1	7,868
Tehama	7	0	0	0	7	42,604
Tulare	9	0	0	0	9	12,232
Ventura	31	5	0	0	26	223,910
Yolo	5	0	0	0	5	26,293
Total	368	36	0	10	322	1,879,745

CALIFORNIA
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Butte	4	0	0	1	3	0	12,010
Colusa	9	0	0	3	6	0	45,607
Contra Costa	1	0	0	0	1	0	5,000
Fresno	100	84	0	0	14	2	430,216
Glenn	26	1	0	12	13	0	147,834
Kern	431	360	0	1	70	0	1,633,433
Kings	2	1	0	0	1	0	3,351
Los Angeles	189	162	0	0	16	11	908,071
Madera	1	0	0	0	1	0	3,050
Monterey	15	14	0	0	1	0	31,679
Orange	89	73	0	0	16	0	401,941
Sacramento	1	0	0	1	0	0	4,500
Santa Barbara	18	17	0	0	1	0	76,075
San Benito	12	5	0	1	6	0	36,968
San Bernardino	1	0	0	0	1	0	4,768
San Joaquin	10	0	0	8	2	0	54,206
San Luis Obispo	3	3	0	0	0	0	7,745
San Mateo	5	2	0	0	3	0	13,218
Solano	2	0	0	0	2	0	12,725
Sutter	1	0	0	1	0	0	5,860
Tehama	1	0	0	0	1	0	2,500
Tulare	3	1	0	1	1	0	11,185
Ventura	184	159	0	0	17	8	1,445,950
Total	1,108	882	0	29	176	21	5,297,892

COLORADO
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Adams	12	0	0	0	12	68,681
Arapahoe	4	0	0	0	4	22,689
Archuleta	6	0	0	0	6	6,608
Baca	11	1	0	2	8	57,916

1958 wildcat and field drilling

COLORADO (Continued)

	Total	Crude	Cond.	Gas	Dry	Footage
Bent	7	0	0	0	7	37,372
Boulder	2	0	0	0	2	7,136
Crowley	1	0	0	0	1	7,200
Delta	1	0	0	0	1	1,700
Dolores	5	0	0	0	5	29,315
El Paso	1	0	0	0	1	1,655
Fremont	6	0	0	0	6	13,124
Garfield	7	0	0	4	3	27,132
Grand	5	0	0	0	5	8,901
Jackson	5	0	1	0	4	19,238
Kiowa	2	0	0	0	2	11,124
Kit Carson	3	0	0	0	3	18,351
Las Animas	1	0	0	0	1	6,210
Larimer	4	0	0	0	4	19,143
La Plata	4	0	0	0	4	9,674
Lincoln	4	0	0	0	4	21,771
Logan	86	4	0	4	78	443,997
Mesa	14	0	0	4	10	55,013
Moffat	13	2	0	2	9	70,575
Montezuma	11	1	0	1	9	65,363
Montrose	1	0	0	0	1	1,869
Morgan	82	8	0	1	73	456,275
Ouray	1	0	0	0	1	3,760
Prowers	4	0	0	1	3	21,277
Pueblo	1	0	0	0	1	2,914
Rio Blanco	13	1	0	1	11	87,024
Routt	11	2	0	0	9	46,178
San Miguel	2	0	0	0	2	7,457
Washington	97	7	0	0	90	413,134
Weld	55	5	0	0	50	419,826
Yuma	3	0	0	0	3	19,314
Total	485	31	1	20	433	2,508,916

COLORADO
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Adams	6	2	0	0	4	0	41,004
Archuleta	1	0	0	0	1	0	1,200
Fremont	4	0	0	0	4	0	12,195
Garfield	6	0	0	3	3	0	23,580
Jackson	5	1	1	0	3	0	21,003
Kiowa	1	0	0	1	0	0	4,940
Larimer	1	1	0	0	0	0	4,869
La Plata	43	3	0	38	2	0	240,436
Logan	50	21	0	3	26	0	253,879
Mesa	2	0	0	2	0	0	10,214
Moffat	15	3	0	6	6	0	76,287
Montezuma	6	1	0	0	5	0	2,910
Morgan	89	46	0	5	38	0	520,377
Rio Blanco	11	3	0	2	6	0	41,004
Routt	7	4	0	0	3	0	25,813
Washington	72	23	0	0	49	0	350,599
Weld	32	10	0	0	22	0	212,516
Total	351	118	1	60	172	0	1,842,826

FLORIDA
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Glades	1	0	0	0	1	10,993
Lee	1	0	0	0	1	11,898
Okaloosa	1	0	0	0	1	6,132
Palm Beach	1	0	0	0	1	12,810
Santa Rosa	2	0	0	0	2	13,920
Walton	1	0	0	0	1	11,946
Total	7	0	0	0	7	67,699

GEORGIA
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Seminole	1	0	0	0	1	238

ILLINOIS
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Adams	5	0	0	0	5	3,112
Bond	21	1	0	0	20	35,254
Brown	2	0	0	0	2	1,135
Cass	1	0	0	0	1	975
Champaign	1	0	0	0	1	550
Christian	22	1	0	0	21	46,906
Clark	17	2	0	0	15	20,712
Clay	9	0	0	0	9	25,909
Clinton	23	1	0	0	22	44,809
Coles	17	2	0	2	13	22,877
Crawford	6	0	0	0	6	7,086
Cumberland	3	0	0	0	3	8,261
DeWitt	1	0	0	0	1	2,508
Douglas	9	0	0	0	9	7,273
Edgar	9	0	0	1	8	4,503
Edwards	3	0	0	0	3	9,886
Effingham	10	1	0	0	9	25,575
Fayette	7	0	0	0	7	14,283
Franklin	8	0	0	0	8	24,352
Gallatin	3	0	0	0	3	8,151
Greene	1	0	0	0	1	615
Hamilton	11	0	0	0	11	39,168
Iroquois	1	0	0	0	1	565
Jackson	2	0	0	0	2	4,408
Jasper	25	3	0	0	22	71,879
Jefferson	16	0	0	0	16	43,289
Lawrence	1	0	0	0	1	1,850
LaSalle	2	0	0	0	2	7,278
Logan	2	0	0	0	2	2,675
Macon	2	0	0	0	2	4,108
Macoupin	18	1	0	0	15	12,301
Madison	7	0	0	0	7	8,428
Marion	11	0	0	0	11	25,857
Mason	1	0	0	0	1	1,400
Menard	1	0	0	0	1	1,597
Montgomery	15	1	0	0	14	24,592
Morgan	1	0	0	0	1	1,335
Moultrie	8	0	0	0	8	19,440
Peoria	1	0	0	0	1	1,801
Perry	4	0	0	0	4	6,501
Piatt	9	0	0	0	9	20,168
Pike	5	0	0	0	5	4,184
Pulaski	3	0	0	0	3	2,140
Randolph	9	0	0	0	9	15,722
Richland	4	3	0	0	1	12,363
Saline	9	2	0	1	6	27,447
Sangamon	10	0	0	0	10	17,028
Schuyler	7	0	0	0	7	4,581
Shelby	9	0	0	0	9	17,322
St. Clair	12	0	0	0	12	14,969
Vermillion	1	0	0	0	1	1,251
Wabash	2	0	0	0	2	5,228
Washington	33	2	0	0	31	58,719
Wayne	13	4	0	0	9	43,179
White	6	1	0	0	5	26,396
Whiteside	1	0	0	0	1	270
Williamson	9	0	0	0	9	26,570
Total	449	25	0	6	418	890,741

ILLINOIS
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Adams	2	0	0	2	0	0	1,062
Bond	21	12	0	0	9	0	28,484
Christian	157	98	0	0	59	0	299,536
Clark	58	37	0	0	19	2	71,239
Clay	114	64	0	0	47	3	334,865
Clinton	39	10	0	1	26	2	68,038
Coles	42	11	0	3	23	5	50,112
Crawford	134	67	0	0	40	27	163,623
Cumberland	1	1	0	0	0	0	1,196
Douglas	19	9	0	1	9	0	33,115
Edgar	11	3	0	0	8	0	4,597
Edwards	26	13	0	0	13	0	81,592
Effingham	22	9	0	0	13	0	54,454
Fayette	33	14	0	0	11	8	63,834
Franklin	45	22	0	0	22	1	137,289
Gallatin	97	69	0	0	27	1	262,556
Hamilton	116	49	0	0	65	2	397,823
Hancock	3	2	0	0	1	0	1,143
Jasper	101	53	0	0	47	1	286,342
Jefferson	51	23	0	0	28	0	133,245
Lawrence	87	53	0	0	25	9	152,545
McDonough	5	2	0	0	3	0	2,251
Macon	13	5	0	0	8	0	25,628
Macoupin	21	12	0	1	8	0	10,739
Madison	4	1	0	0	2	1	4,580
Marion	57	24	0	3	26	4	139,770
Montgomery	3	1	0	0	2	0	2,167
Morgan	1	0	0	1	0	0	272
Perry	19	8	0	0	11	0	23,778

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1958 wildcat and field drilling

ILLINOIS (Continued)

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Pike	10	0	0	4	6	0	7,456
Randolph	4	1	0	0	3	0	5,752
Richland	61	26	0	0	34	1	190,859
St. Clair	27	0	0	26	1	0	11,609
Saline	69	26	0	0	41	2	205,582
Sangamon	7	1	0	0	6	0	12,400
Shelby	7	3	0	0	4	0	16,622
Wabash	87	39	0	0	45	3	209,676
Washington	50	24	0	0	25	1	80,571
Wayne	164	84	0	0	58	22	514,160
White	173	98	0	1	74	0	485,325
Williamson	9	4	0	0	5	0	27,095
Total	1,970	978	0	43	854	95	4,602,982

INDIANA
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Boone	3	0	0	3	0	4,388
Brown	1	0	0	0	1	1,925
Clay	8	1	0	0	7	12,888
Daviess	12	0	0	0	12	14,677
Dearborn	1	0	0	0	1	1,650
Dubois	6	0	0	0	6	7,989
Fountain	1	0	0	0	1	3,013
Gibson	67	14	0	0	53	130,953
Greene	3	0	0	0	3	2,602
Huntington	1	0	0	0	1	947
Jefferson	1	0	0	0	1	680
Jennings	1	0	0	0	1	1,690
Knox	5	1	0	0	4	8,362
Lawrence	1	0	0	0	1	140
Martin	3	0	0	0	3	1,881
Miami	2	0	0	0	2	2,014
Monroe	2	0	0	2	0	3,652
Orange	2	0	0	0	2	4,202
Owen	1	0	0	0	1	1,552
Perry	13	0	0	0	13	9,503
Pike	11	1	0	0	10	15,465
Posey	27	4	0	0	23	61,192
Putnam	2	0	0	0	2	2,286
Randolph	1	0	0	0	1	1,261
Spencer	95	14	0	0	81	104,904
Steuben	2	0	0	0	2	6,533
Sullivan	12	1	0	0	11	19,807
Vanderburgh	14	1	0	0	13	25,826
Vigo	6	0	0	0	6	8,858
Warrick	3	0	0	0	3	4,007
Total	307	37	0	5	265	464,847

INDIANA
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Adams	1	0	0	0	1	0	1,111
Cass	1	1	0	0	0	0	939
Clay	5	3	0	0	2	0	8,030
Crawford	1	0	0	0	1	0	1,728
Daviess	6	0	0	0	6	0	6,996
Decatur	3	0	0	3	0	0	2,555
DeKalb	1	0	0	0	1	0	2,604
Delaware	1	0	0	0	1	0	1,210
Dubois	4	1	0	0	3	0	4,403
Fayette	1	0	0	1	0	0	1,382
Gibson	219	124	0	0	95	0	408,608
Harrison	6	1	0	0	5	0	4,553
Huntington	1	0	0	0	1	0	1,058
Jay	1	0	0	0	1	0	1,119
Knox	11	4	0	0	7	0	18,171
Lawrence	1	0	0	0	1	0	910
Miami	3	2	0	0	1	0	2,781
Perry	2	1	0	0	0	1	443
Pike	50	17	0	0	33	0	72,491
Posey	112	67	0	0	41	4	226,584
Ripley	1	0	0	0	1	0	943
Rush	4	0	0	4	0	0	3,529
Shelby	2	0	0	2	0	0	1,730
Spencer	84	39	0	0	45	0	91,898
Sullivan	19	3	0	1	15	0	27,129
Vanderburgh	24	7	0	0	17	0	39,323
Vigo	6	3	0	0	3	0	8,930
Total	570	273	0	11	281	5	941,158

KANSAS
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Barber	29	2	1	2	24	131,992
Barton	16	5	0	1	10	55,754
Butler	48	5	0	0	43	134,400
Chase	9	0	0	0	9	26,527
Chautauqua	7	0	0	0	7	17,012
Cheyenne	4	0	0	0	4	21,083
Clark	2	0	0	1	1	11,520
Clay	2	0	0	0	2	3,935
Comanche	8	0	0	1	7	41,932
Cowley	45	8	0	0	37	133,342
Decatur	3	1	0	0	2	11,855
Dickinson	11	0	0	0	11	30,109
Edwards	6	3	0	0	3	27,262
Elk	5	0	0	0	5	12,169
Ellis	32	6	0	0	26	118,766
Ellsworth	4	0	0	0	4	12,689
Finney	3	1	0	0	2	16,248
Ford	1	0	0	0	1	5,035
Gove	9	0	0	0	9	40,332
Graham	80	19	0	0	61	314,217
Grant	2	0	0	2	0	11,672
Gray	1	0	0	0	1	5,167
Greeley	1	0	0	0	1	5,353
Greenwood	12	3	0	0	9	26,662
Hamilton	4	0	0	1	3	22,194
Harper	18	3	0	1	14	86,942
Harvey	20	2	0	0	18	63,818
Haskell	4	3	0	0	1	22,585
Hodgeman	8	0	0	0	8	37,471
Kingman	20	2	0	1	17	87,635
Kiowa	11	2	0	0	9	54,626
Lane	1	0	0	0	1	4,646
Leavenworth	1	0	0	0	1	690
Lincoln	2	0	0	0	2	4,550
Logan	4	0	0	0	4	19,922
Lyon	4	0	0	0	4	12,100
McPherson	24	3	0	1	20	78,026
Marion	50	3	0	0	47	141,100
Marshall	1	0	0	0	1	2,007
Meade	7	1	0	2	4	41,672
Mitchell	1	0	0	0	1	3,878
Montgomery	1	0	0	0	1	1,775
Morris	2	0	0	0	2	6,493
Morton	4	0	0	3	1	21,359
Ness	12	4	0	0	8	54,500
Norton	9	2	0	0	7	33,460
Osborne	1	0	0	0	1	3,847
Pawnee	11	2	0	0	9	45,771
Phillips	3	0	0	0	3	11,168
Pottawatomie	1	0	0	0	1	3,526
Pratt	10	2	0	2	6	46,501
Rawlins	9	2	0	0	7	44,493
Reno	15	2	0	1	12	61,569
Rice	11	0	0	0	11	37,785
Riley	2	0	0	0	2	4,172
Rooks	19	4	0	0	15	69,759
Rush	13	0	0	0	13	51,714
Russell	15	3	0	0	12	49,608
Saline	4	1	0	0	3	11,779
Sedgwick	27	4	0	0	23	91,756
Seward	4	1	0	2	1	24,833
Shawnee	1	0	0	0	1	2,640
Sheridan	18	0	0	0	18	75,740
Sherman	13	3	0	0	10	70,611
Stafford	30	5	0	0	25	122,819
Stevens	1	0	0	1	0	6,020
Sumner	48	9	0	1	38	193,091
Thomas	9	0	0	0	9	46,130
Trego	20	1	0	0	19	89,611
Wabaunsee	7	1	0	0	6	20,717
Wallace	1	0	0	0	1	5,240
Wichita	1	1	0	0	0	6,000
Wilson	1	0	0	0	1	1,310
Woodson	1	0	0	0	1	1,541
Total	844	119	1	23	701	3,216,233

KANSAS
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Barber	111	40	1	33	36	1	494,143
Barton	199	103	0	0	86	10	696,722
Butler	226	120	0	0	92	14	590,177
Chase	7	7	0	0	0	0	17,371

During the century since Colonel Drake first tapped oil with his crude cable tools, Torrington Bearings have played an important part in the development of drilling and production technology. Torrington makes every major type of anti-friction bearing to meet every requirement.

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Torrington works closely with equipment designers in research, development, engineering and production of anti-friction bearings to meet the special needs of oil-field equipment. These specialized skills will help meet tomorrow's problems, too...because Torrington offers technical assistance, workmanship and quality bearings as its contribution to a partnership in progress.

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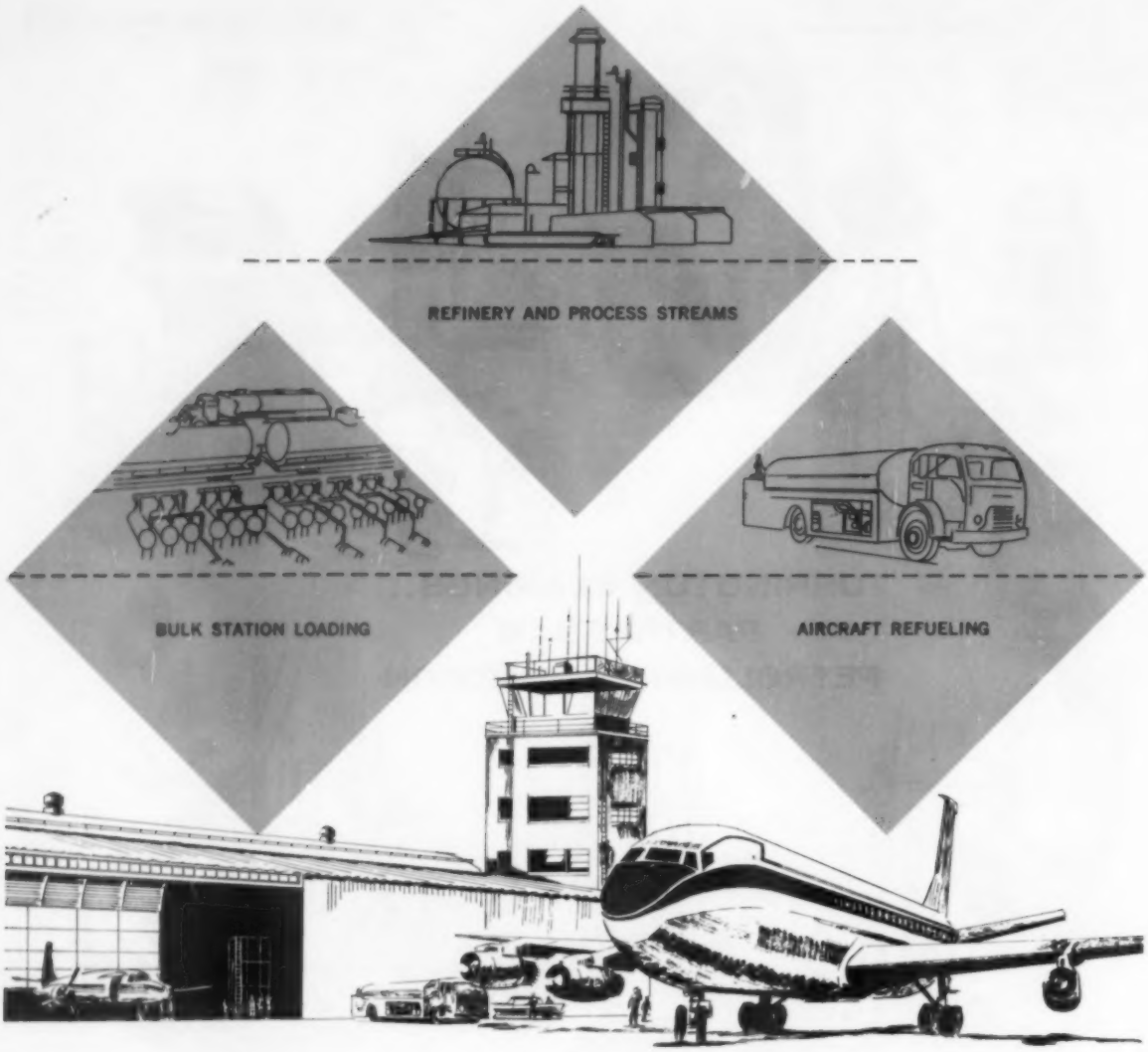

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fast, economically with WARNER LEWIS *conversion kits*

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WARNER LEWIS COMPANY
BOX 3096 • TULSA, OKLAHOMA

DIVISION OF FRAM CORPORATION

1958 wildcat and field drilling

KANSAS (Continued)

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Chautauqua	3	0	0	0	3	0	6,259
Clark	10	0	0	6	4	0	57,111
Clay	3	0	0	0	3	0	6,596
Coffey	8	4	0	0	4	0	13,506
Comanche	8	2	0	6	0	0	40,045
Cowley	245	122	0	4	107	12	693,272
Decatur	5	3	0	0	2	0	19,575
Dickinson	6	2	0	0	4	0	15,160
Edwards	30	20	0	6	4	0	132,002
Elk	1	0	0	0	1	0	3,001
Ellis	237	116	0	0	107	14	865,497
Ellsworth	15	4	0	0	11	0	49,809
Finney	43	13	0	26	4	0	150,701
Ford	2	0	0	0	2	0	10,173
Gove	1	0	0	0	1	0	4,356
Graham	261	144	0	0	113	4	1,023,632
Grant	1	0	0	0	1	0	3,950
Greenwood	198	139	0	0	51	8	407,345
Hamilton	1	0	0	0	1	0	2,610
Harper	56	35	1	6	10	4	252,409
Harvey	32	15	0	0	15	2	98,058
Haskell	13	8	0	1	4	0	71,641
Hodgeman	11	8	0	0	3	0	51,539
Kearny	1	0	0	0	1	0	5,394
Kingman	99	52	0	21	23	3	424,966
Kiowa	25	11	2	5	6	1	129,228
Lyon	3	3	0	0	0	0	6,415
McPherson	112	82	0	1	21	8	346,030
Marion	228	165	0	3	45	15	563,894
Meade	52	13	4	15	20	0	306,637
Morris	4	2	0	0	2	0	11,210
Morton	39	6	0	25	8	0	151,551
Nemaha	2	1	0	0	1	0	6,489
Ness	14	9	0	0	5	0	60,885
Norton	18	12	0	0	6	0	65,636
Osborne	2	0	0	0	2	0	6,739
Pawnee	18	5	0	1	12	0	72,153
Phillips	26	20	0	0	6	0	91,202
Pratt	23	8	0	1	14	0	102,185
Reno	38	10	0	15	12	1	144,814
Rice	96	57	0	0	37	2	320,950
Rooks	89	40	0	0	49	0	326,767
Rush	19	5	0	2	12	0	68,941
Russell	115	75	0	0	36	4	377,905
Saline	18	12	0	0	6	0	56,245
Scott	2	1	0	0	1	0	9,720
Sedgwick	103	66	0	0	33	4	317,838
Seward	18	0	0	14	4	0	62,057
Sheridan	16	11	0	0	5	0	63,991
Stafford	100	45	0	3	48	4	402,006
Stanton	8	0	0	7	1	0	26,115
Stevens	4	0	0	4	0	0	11,181
Sumner	95	48	0	0	42	5	353,288
Trego	36	15	0	0	21	0	140,725
Wabaunsee	5	1	0	0	2	2	14,892
Woodson	17	10	0	0	7	0	24,349
Total	3,178	1,690	8	205	1,157	118	10,849,058

KENTUCKY
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Barren	2	2	0	0	0	600
Breckenridge	3	0	0	0	3	1,761
Breathitt	70	7	0	1	62	126,225
Butler	7	1	0	0	6	5,360
Calloway	1	0	0	0	1	5,610
Carter	2	0	0	0	2	7,284
Christian	7	0	0	0	7	5,314
Clay	1	0	0	0	1	1,845
Cumberland	1	0	0	0	1	1,500
Daviess	5	1	0	0	4	4,992
Edmonson	3	0	0	0	3	4,440
Grayson	1	0	0	0	1	670
Green	1	0	0	0	1	395
Hancock	3	0	0	0	3	1,987
Hart	4	0	0	0	4	5,776
Henderson	4	3	0	0	1	8,054
Hopkins	10	1	0	0	9	23,333
Lee	1	1	0	0	0	1,416
Logan	2	1	0	0	1	2,218
McLean	2	1	0	0	1	3,976
Menifee	1	0	0	0	1	588
Muhlenberg	16	2	0	1	13	24,082
Ohio	14	2	0	1	11	17,957
Owsley	2	0	0	0	2	3,060
Taylor	3	1	0	0	2	1,736
Todd	1	0	0	0	1	981
Union	2	0	0	0	2	3,419
Warren	2	2	0	0	0	2,200
Webster	4	1	0	0	3	10,560
Whitley	1	0	0	1	0	1,425
Total	176	26	0	4	146	278,764

KENTUCKY
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Breckenridge	60	23	0	0	37	0	25,665
Breathitt	119	98	0	6	15	0	209,677
Butler	19	6	0	0	10	3	14,183
Christian	58	40	0	3	15	0	42,303
Daviess	175	72	0	1	102	0	257,633
Floyd	4	0	0	3	1	0	8,893
Grayson	4	1	0	0	3	0	4,750
Green	844	702	0	0	142	0	372,969
Hancock	36	13	0	0	23	0	24,779
Harlan	2	1	0	1	0	0	5,466
Henderson	114	59	0	1	54	0	230,645
Hopkins	27	8	0	6	13	0	49,216
Johnson	3	0	0	2	1	0	4,008
Knott	17	0	0	16	1	0	50,723
Laurence	11	1	0	9	1	0	14,796
Letcher	5	0	0	5	0	0	19,100
McLean	56	21	0	1	33	1	95,992
Magoffin	8	0	0	4	4	0	14,826
Martin	7	0	0	6	1	0	21,790
Muhlenberg	163	70	0	21	69	3	192,456
Ohio	81	41	0	0	40	0	60,514
Pike	54	2	0	50	2	0	199,228
Taylor	3	0	0	0	3	0	1,524
Todd	2	1	0	0	1	0	1,040
Union	47	21	0	0	26	0	87,799
Webster	42	18	0	0	24	0	96,460
Total	1,961	1,198	0	135	621	7	2,106,435

LOUISIANA OFFSHORE
Wildcat Completions by Areas

	Total	Crude	Cond.	Gas	Dry	Footage
East Cameron	3	0	0	0	3	29,166
West Cameron	3	0	1	0	2	41,384
Eugene Island	2	1	0	0	1	23,812
Ship Shoal	2	0	0	0	2	23,793
South Marsh Island	6	0	3	0	3	74,260
South Timbalier	6	1	0	0	5	65,978
Vermilion	3	0	1	0	2	33,266
West Delta	2	1	0	0	1	20,242
Total	27	3	5	0	19	311,901

LOUISIANA OFFSHORE
Development Completions by Areas

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Bay Marchand	46	34	2	1	9	0	391,941
East Cameron	22	0	15	2	5	0	238,487
West Cameron	15	1	9	2	3	0	170,683
Eugene Island	43	14	9	0	20	0	480,541
Grand Isle	30	25	0	0	5	0	316,191
Main Pass	34	29	0	0	5	0	291,018
Ship Shoal	20	8	3	0	9	0	212,519
South Marsh Island	2	0	2	0	0	0	24,924
South Pass	81	72	1	1	6	1	663,341
South Pelto	2	1	0	0	1	0	21,045
South Timbalier	31	14	2	0	15	0	342,175
Vermilion	19	3	8	1	7	0	178,314
West Delta	47	34	1	0	12	0	482,470
Total	392	235	52	7	97	1	3,813,649

NORTH LOUISIANA
Wildcat Completions by Parishes

	Total	Crude	Cond.	Gas	Dry	Footage
Bienville	8	0	0	2	6	39,473
Bossier	11	1	0	0	10	41,260
Caddo	16	0	0	1	15	61,820
Caldwell	2	0	0	0	2	7,940

1958 wildcat and field drilling

NORTH LOUISIANA (Continued)

	Total	Crude	Cond.	Gas	Dry	Footage
Catahoula	34	1	0	1	32	196,961
Claiborne	3	0	0	0	3	19,927
Concordia	28	6	0	0	22	178,532
DeSoto	17	1	0	1	15	59,415
Franklin	20	3	0	2	15	111,706
Grant	6	0	0	0	6	18,812
Jackson	0	0	0	0	0	*1,478
LaSalle	23	5	0	0	18	101,943
Lincoln	1	0	0	1	0	8,834
Madison	4	0	0	0	4	29,196
Morehouse	2	0	0	0	2	8,551
Natchitoches	5	0	0	0	5	15,874
Ouachita	7	0	0	3	4	54,354
Red River	18	2	0	0	16	56,423
Richland	2	0	0	0	2	12,657
Sabine	3	1	0	0	2	10,599
Tensas	14	3	0	4	7	122,519
Union	4	0	0	0	4	20,221
Webster	11	1	0	2	8	74,326
Winn	4	0	0	0	4	14,193
Total	243	24	0	17	202	1,267,014

*Additional footage of old well drilled deeper.

NORTH LOUISIANA
Development Completions by Parishes

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Bienville	15	3	0	3	9	0	92,263
Bossier	38	9	0	14	15	0	196,963
Caddo	379	317	0	16	46	0	834,770
Catahoula	22	6	0	0	16	0	108,334
Claiborne	31	13	0	6	12	0	201,892
Concordia	47	22	0	0	25	0	266,118
DeSoto	145	53	0	23	69	0	401,390
Franklin	21	6	0	1	14	0	101,716
Grant	21	9	0	0	12	0	41,380
LaSalle	111	68	0	0	43	0	299,492
Lincoln	6	0	0	4	2	0	52,922
Natchitoches	20	18	0	0	2	0	32,544
Ouachita	4	1	0	2	1	0	38,994
Red River	92	22	0	42	28	0	193,119
Richland	5	4	0	0	1	0	22,538
Sabine	57	18	0	3	36	0	160,936
Tensas	44	25	0	4	15	0	334,776
Union	39	0	0	35	4	0	119,134
Webster	38	14	0	8	16	0	192,229
Winn	6	4	0	0	2	0	11,261
Total	1,141	612	0	161	368	0	3,702,771

SOUTH LOUISIANA ONSHORE
Wildcat Completions by Parishes

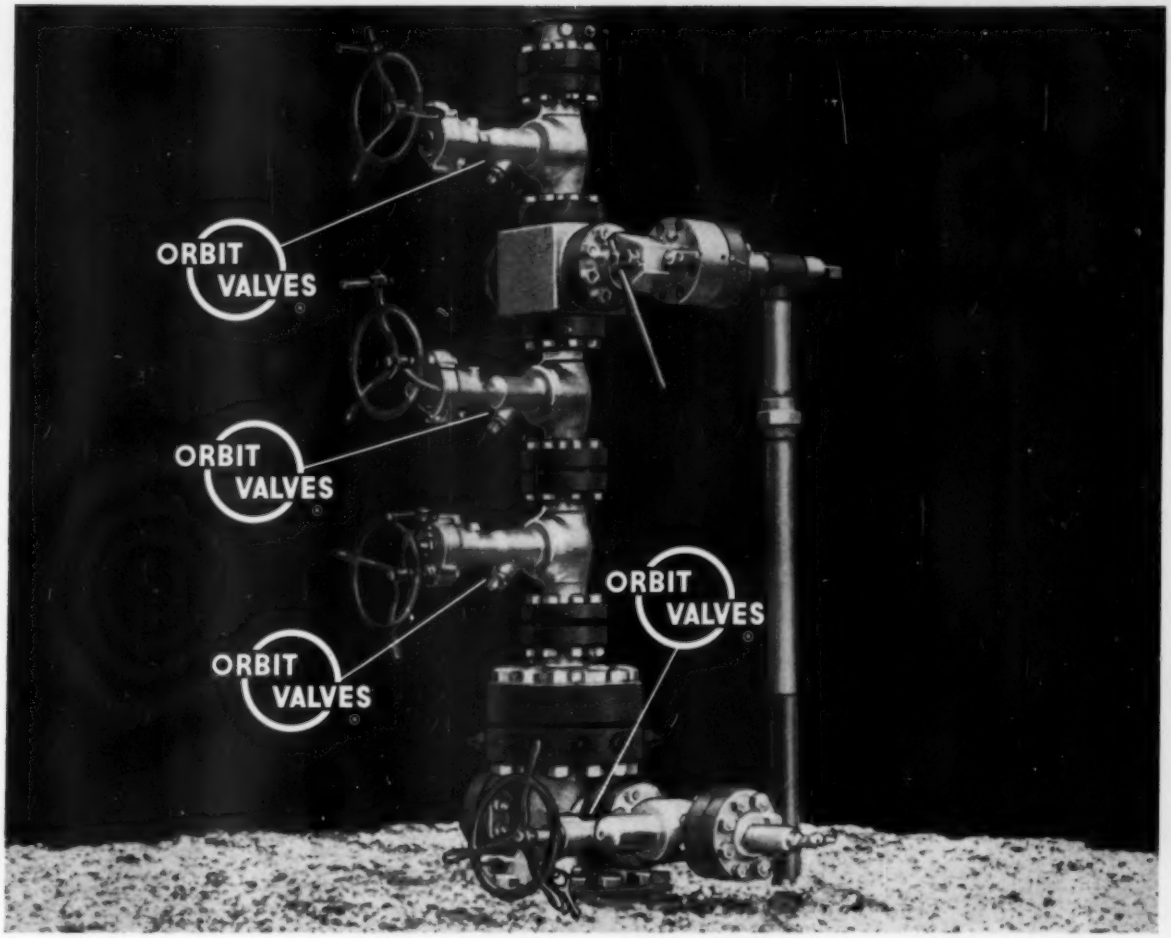
	Total	Crude	Cond.	Gas	Dry	Footage
Acadia	11	0	1	0	10	126,377
Allen	7	0	1	0	6	68,818
Assumption	3	0	1	0	2	33,633
Avoyelles	3	0	0	0	3	27,020
Beauregard	9	1	1	0	7	85,623
Calcasieu	15	0	1	0	14	159,821
Cameron	9	0	0	0	9	115,573
E. Baton Rouge	1	0	0	0	1	10,820
Evangeline	4	0	0	0	4	42,222
Iberia	7	0	0	0	7	95,197
Iberville	4	0	0	0	4	42,932
Jefferson	10	0	0	0	10	113,996
Jefferson Davis	6	0	1	0	5	61,317
Lafayette	4	0	1	0	3	53,531
Lafourche	29	0	1	0	28	284,299
Orleans	4	0	0	1	3	31,807
Plaquemines	28	3	1	0	24	317,760
Pointe Coupee	5	2	0	0	3	50,485
Rapides	7	1	0	0	6	45,758
St. Bernard	7	0	0	0	7	64,954
St. Charles	5	0	2	0	3	47,643
St. James	5	0	0	0	5	58,671
St. John the Baptist	5	1	0	0	4	54,890
St. Landry	10	0	0	0	10	103,832
St. Martin	8	0	1	0	7	112,807
St. Mary	7	0	1	0	6	95,772
Terrebonne	30	3	6	0	21	422,858
Vermilion	17	0	3	0	14	227,034
W. Baton Rouge	1	0	0	0	1	10,983
Total	261	11	22	1	227	2,966,433

SOUTH LOUISIANA ONSHORE
Development Completions by Parishes

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Acadia	110	57	17	1	35	0	911,042
Allen	20	5	3	0	12	0	190,414
Ascension	7	4	1	0	2	0	45,413
Assumption	20	11	4	0	5	0	240,323
Avoyelles	1	0	0	0	1	0	8,620
Beauregard	30	13	5	0	12	0	255,374
Calcasieu	67	20	6	2	38	1	473,931
Cameron	73	23	19	2	24	5	682,048
E. Baton Rouge	1	0	0	0	1	0	10,208
Evangeline	10	4	2	0	4	0	81,891
Iberia	44	18	11	2	13	0	489,453
Iberville	22	16	0	0	6	0	163,407
Jefferson	39	24	2	0	13	0	408,155
Jefferson Davis	47	6	13	0	28	0	545,236
Lafayette	9	3	3	0	3	0	116,988
Lafourche	150	70	27	3	50	0	1,643,321
Livingston	2	0	0	0	2	0	20,598
Plaquemines	251	191	15	8	37	0	2,495,910
Rapides	7	3	0	0	4	0	42,039
St. Bernard	2	2	0	0	0	0	17,700
St. Charles	32	16	4	0	12	0	335,680
St. James	6	1	3	0	2	0	66,772
St. John the Baptist	10	9	0	0	1	0	99,382
St. Landry	52	17	8	1	25	1	411,994
St. Martin	61	32	6	3	20	0	462,097
St. Mary	84	54	10	4	16	0	1,007,684
Terrebonne	218	113	46	2	57	0	2,698,486
Vermilion	78	16	17	0	45	0	976,536
W. Baton Rouge	6	3	1	0	2	0	61,572
Total	1,459	731	223	28	470	7	14,962,274

MICHIGAN
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Antrim	1	0	0	0	1	1,014
Allegan	14	0	0	3	11	37,237
Arenac	3	0	0	0	3	9,136
Barry	1	0	0	0	1	3,003
Calhoun	1	1	0	0	0	4,324
Clare	3	0	0	0	3	10,018
Cheboygan	3	0	0	0	3	10,775
Crawford	1	0	0	0	1	4,069
Gladwin	1	0	0	0	1	5,179
Gratiot	3	0	0	0	3	9,603
Genesee	1	0	0	0	1	3,323
Hillsdale	4	0	0	0	4	16,472
Ingham	1	0	0	0	1	2,901
Isabella	7	1	0	1	5	25,370
Jackson	4	0	0	0	4	13,888
Kalamazoo	1	0	0	0	1	1,312
Kent	6	0	0	0	6	15,776
Lake	1	0	0	0	1	875
Lenawee	1	0	0	0	1	4,453
Livingston	1	0	0	0	1	1,139
Mason	8	2	0	0	6	15,898
Mecosta	7	0	0	0	7	23,801
Monroe	1	1	0	0	0	2,382
Montcalm	12	1	0	1	10	33,345
Muskegon	1	0	0	0	1	1,871
Newaygo	6	2	0	1	3	16,716
Oceana	12	0	0	0	12	29,102
Ogemaw	2	1	0	0	1	7,732
Osceola	3	0	0	0	3	11,864
Oscoda	1	0	0	0	1	4,245
Ottawa	8	1	0	0	7	22,627
St. Clair	8	1	0	0	7	21,730
Saginaw	4	0	0	1	3	10,325
Shiawassee	4	0	0	0	4	11,834
St. Joseph	1	0	0	0	1	3,100
Tuscola	2	0	0	0	2	7,026
Washtenaw	1	0	0	1	0	4,702
Van Buren	5	0	0	0	5	7,137
Wexford	1	0	0	0	1	4,101
Total	145	11	0	8	126	419,405



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1958 wildcat and field drilling

MICHIGAN
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Allegan	48	12	0	5	31	0	89,701
Arenac	1	1	0	0	0	0	4,192
Bay	6	5	0	0	1	0	16,624
Clare	11	0	0	1	10	0	38,346
Crawford	1	1	0	0	0	0	4,275
Genesee	1	0	0	0	1	0	2,570
Gladwin	8	4	0	0	4	0	34,921
Gratiot	2	2	0	0	0	0	5,657
Hillsdale	20	14	0	0	6	0	99,282
Huron	0	0	0	0	0	0	*3,850
Isabella	4	3	0	1	0	0	22,804
Kalamazoo	1	1	0	0	0	0	1,283
Kent	5	4	0	1	0	0	18,141
Lapeer	2	0	0	2	0	0	2,899
Mason	8	8	0	0	0	0	27,606
Mecosta	1	0	0	1	0	0	1,327
Missaukee	0	0	0	0	0	0	*1,326
Midland	3	2	0	1	0	0	11,234
Monroe	1	1	0	0	0	0	7,416
Montcalm	16	13	0	0	3	0	72,153
Newaygo	13	0	0	0	13	0	21,224
Ogemaw	3	2	0	0	1	0	12,870
Oceana	15	8	0	0	7	0	37,637
Osceola	9	8	0	0	1	0	38,965
Otsego	3	0	0	3	0	0	4,683
Ottawa	17	15	0	0	2	0	33,651
Roscommon	6	4	0	2	0	0	28,554
Saginaw	20	17	0	0	3	0	51,766
St. Clair	14	9	0	1	4	0	37,673
Tuscola	13	13	0	0	0	0	35,333
Van Buren	3	0	0	0	3	0	3,925
Wayne	2	1	0	1	0	0	8,708
Washtenaw	1	0	0	0	1	0	1,095
Wexford	1	0	0	0	1	0	1,290
Total	291	148	0	19	92	†32	782,981

*Drilled deeper. †Included in dry holes.

MISSISSIPPI
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Adams	31	6	0	0	25	212,542
Chickasaw	1	0	0	0	1	11,020
Claiborne	2	0	0	0	2	22,836
Clarke	4	1	0	0	3	25,046
Clay	2	0	1	0	1	17,540
Forrest	2	0	0	0	2	18,522
Franklin	10	2	0	0	8	73,098
George	1	0	0	0	1	11,019
Greene	4	0	0	0	4	51,432
Hancock	3	0	0	0	3	31,551
Hinds	3	1	0	0	2	29,232
Itawamba	1	0	0	0	1	410
Jasper	4	1	0	0	3	44,975
Jefferson	11	0	0	0	11	84,138
Jefferson Davis	3	0	1	0	2	33,917
Jones	7	2	0	0	5	70,241
Lamar	1	0	0	0	1	10,715
Lauderdale	1	0	0	0	1	2,700
Lawrence	2	0	0	0	2	27,306
Leflore	1	0	0	0	1	5,001
Lincoln	9	2	0	0	7	98,026
Madison	2	0	0	0	2	12,768
Marion	5	1	0	0	4	56,885
Monroe	1	0	0	1	0	5,137
Pearl River	5	0	1	0	4	49,098
Perry	1	0	0	0	1	13,856
Pike	3	1	0	0	2	33,200
Rankin	3	0	0	0	3	35,965
Sharkey	2	0	0	0	2	11,921
Simpson	3	0	0	0	3	43,325
Smith	6	2	0	0	4	78,552
Stone	2	0	0	0	2	19,279
Tallahatchie	2	0	0	0	2	7,743
Walthall	2	0	0	0	2	23,922
Warren	3	0	0	0	3	28,723
Washington	2	0	0	0	2	8,566
Wayne	12	1	0	0	11	102,799
Wilkinson	11	0	0	0	11	83,130
Yazoo	6	0	0	0	6	43,178
Total	174	20	3	1	150	1,539,314

MISSISSIPPI
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Adams	42	23	0	0	19	0	262,670
Clarke	5	2	0	0	3	0	24,026
Forrest	15	1	11	1	2	0	99,594
Franklin	10	7	0	0	3	0	62,914
Hinds	4	3	0	0	1	0	47,551
Jasper	4	2	0	0	2	0	25,336
Jefferson	9	2	0	0	7	0	61,971
Jones	1	1	0	0	0	0	5,708
Lamar	10	10	0	0	0	0	89,549
Lincoln	41	35	0	0	6	0	451,841
Pearl River	14	4	8	0	2	0	140,999
Pike	16	11	0	0	5	0	174,965
Sharkey	1	0	0	0	1	0	6,246
Simpson	4	4	0	0	0	0	52,353
Smith	11	8	0	0	3	0	143,378
Walthall	1	1	0	0	0	0	15,739
Wayne	28	19	0	0	9	0	301,876
Wilkinson	5	2	0	0	3	0	35,719
Yazoo	3	2	0	0	1	0	18,906
Total	224	137	19	1	67	0	2,021,341

One old well drilled deeper not included.

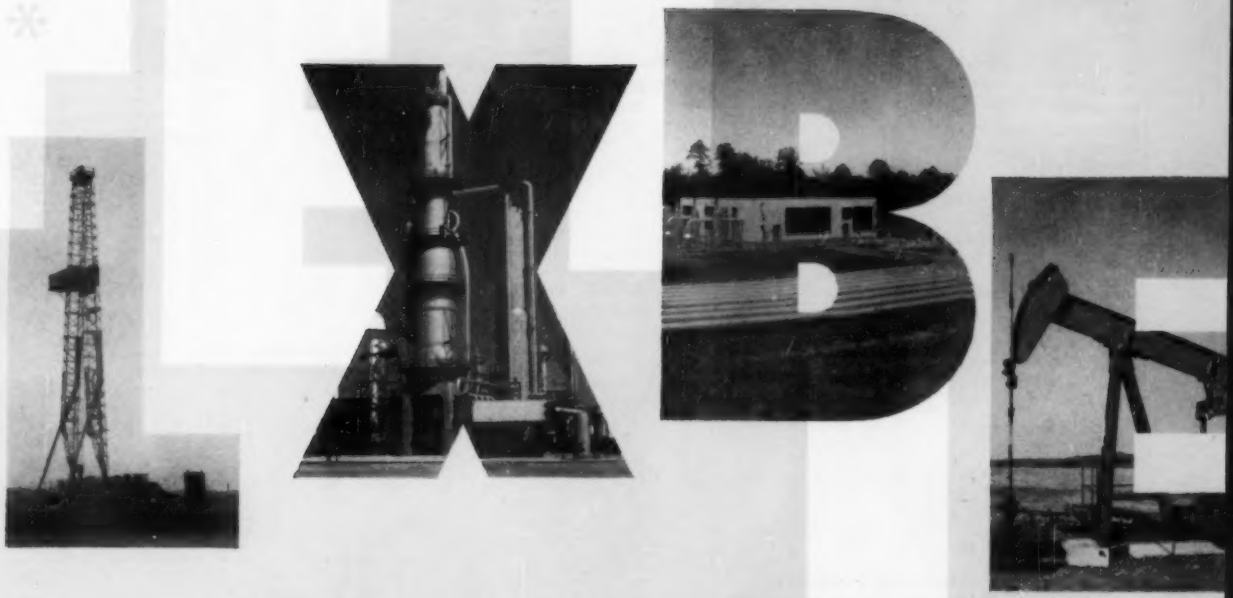
MONTANA
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Big Horn	3	0	0	0	3	15,089
Blaine	5	0	0	0	5	21,022
Carbon	5	0	1	0	4	24,760
Carter	1	0	0	0	1	4,656
Cascade	3	0	0	0	3	2,822
Custer	2	0	0	0	2	8,295
Dawson	3	0	0	0	3	32,367
Fallon	2	1	0	0	1	18,285
Fergus	10	0	0	0	10	22,381
Garfield	2	0	0	0	2	13,775
Glacier	9	3	0	1	5	36,593
Golden Valley	1	0	0	0	1	7,060
Hill	5	0	0	0	5	15,948
Liberty	4	0	0	0	4	9,025
McCone	1	0	0	0	1	6,965
Meagher	1	0	0	0	1	4,213
Musselshell	17	1	0	0	16	75,228
Petroleum	4	0	0	0	4	10,313
Phillips	3	0	0	1	2	10,079
Pondera	6	1	0	0	5	12,172
Powder River	8	0	0	0	8	45,566
Richland	1	0	0	0	1	7,299
Rosebud	7	1	0	0	6	33,450
Roosevelt	4	0	0	0	4	27,321
Sheridan	7	2	0	0	5	72,274
Stillwater	4	0	0	2	2	17,141
Teton	6	1	0	1	4	20,485
Toole	4	0	0	0	4	11,648
Treasure	1	0	0	0	1	6,617
Valley	3	0	0	0	3	10,081
Wheatland	1	0	0	0	1	2,500
Yellowstone	3	1	0	0	2	20,830
Total	136	11	1	5	119	626,260

MONTANA
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Carbon	4	1	0	0	3	0	26,672
Carter	1	0	0	0	1	0	8,910
Daniels	2	2	0	0	0	0	13,327
Dawson	2	1	0	0	1	0	17,996
Fallon	44	40	0	0	4	0	402,111
Glacier	24	18	0	1	5	0	69,787
Liberty	7	7	0	0	0	0	16,775
McCone	4	3	0	0	1	0	30,930
Musselshell	15	9	0	0	6	0	78,262
Petroleum	3	0	0	0	3	0	8,490
Pondera	6	4	0	0	2	0	13,819
Rosebud	16	11	0	0	5	0	80,951
Roosevelt	3	2	0	0	1	0	18,525
Sheridan	13	8	0	0	5	0	120,729
Teton	9	6	0	0	3	0	18,275
Toole	35	23	0	0	11	1	56,364
Wibaux	13	13	0	0	0	0	117,784
Yellowstone	1	0	0	0	1	0	6,133
Total	202	148	0	1	52	1	1,105,840

Webster defines **FLEXIBLE** as "responsive to, or readily adjustable to conditions".



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1958 wildcat and field drilling

NEBRASKA
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Adams	2	0	0	0	2	8,174
Banner	90	8	0	0	82	550,203
Blaine	1	0	0	0	1	3,586
Chase	1	0	0	0	1	4,823
Cherry	1	0	0	0	1	4,489
Cheyenne	52	2	0	0	50	275,346
Dawes	1	0	0	0	1	5,150
Deuel	1	0	0	0	1	3,717
Dundy	3	1	0	0	2	13,435
Frontier	4	0	0	0	4	13,535
Gage	1	0	0	0	1	1,849
Garden	5	0	0	0	5	19,364
Grant	1	0	0	0	1	4,086
Harlan	1	1	0	0	0	3,650
Hayes	5	0	0	0	5	22,820
Hitchcock	4	1	0	0	3	18,621
Jefferson	1	0	0	0	1	3,180
Kimball	134	25	0	0	109	874,648
Morrill	19	2	0	0	17	89,783
Red Willow	4	0	0	0	4	15,018
Richardson	2	0	0	0	2	6,732
Saunders	1	0	0	0	1	1,361
Scotts Bluff	12	0	0	0	12	65,820
Sheridan	1	0	0	0	1	4,626
Sioux	1	0	0	0	1	4,911
Total	348	40	0	0	308	2,018,927

NEBRASKA
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Banner	108	57	0	0	51	0	669,704
Cheyenne	50	16	0	0	34	0	257,167
Dundy	2	1	0	0	1	0	8,605
Garden	1	0	0	0	1	0	3,265
Kimball	191	89	0	0	102	0	1,233,790
Morrill	20	9	0	0	11	0	96,406
Richardson	8	3	0	0	5	0	21,698
Total	380	175	0	0	205	0	2,290,635

WEST NEW MEXICO
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Catron	1	0	0	0	1	5,642
Hidalgo	1	0	0	0	1	2,726
McKinley	12	1	0	0	11	35,598
Rio Arriba	12	2	1	0	9	56,736
Sandoval	16	1	0	0	15	71,989
San Juan	59	5	2	4	48	242,243
Valencia	2	0	0	0	2	7,669
Total	103	9	3	4	87	422,603

WEST NEW MEXICO
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
McKinley	2	0	0	0	2	0	707
Rio Arriba	335	27	2	287	19	0	1,584,097
Sandoval	1	0	0	1	0	0	3,250
San Juan	496	286	6	176	28	0	1,986,456
Total	834	313	8	464	49	0	3,574,510

EAST NEW MEXICO
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Chaves	20	2	0	0	18	110,794
Colfax	1	0	0	0	1	1,607
De Baca	4	0	0	0	4	10,867
Eddy	54	7	1	4	42	189,745
Guadalupe	5	0	0	0	5	21,733
Harding	1	0	0	0	1	2,850
Lea	64	11	1	1	51	521,938
Mora	1	0	0	0	1	7,765
Otero	1	0	0	0	1	5,043
Quay	1	0	0	0	1	2,710
Roosevelt	5	1	0	0	4	39,663
San Miguel	4	0	0	0	4	19,797
Union	2	0	0	0	2	7,401
Total	163	21	2	5	135	941,913

EAST NEW MEXICO
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Chaves	41	30	0	0	11	0	110,163
Eddy	256	195	3	4	48	6	796,702
Lea	503	437	5	14	47	0	2,936,145
Roosevelt	10	7	0	0	3	0	87,369
Total	810	669	8	18	109	6	3,930,379

NORTH DAKOTA
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Billings	2	1	0	0	1	17,732
Bottineau	46	4	0	0	42	174,655
Bowman	1	1	0	0	0	8,980
Burke	22	6	0	0	16	147,812
Cavalier	1	0	0	0	1	3,368
Divide	5	1	0	0	4	46,621
Dunn	1	0	0	0	1	8,907
Golden Valley	2	0	0	0	2	18,577
Hettinger	1	0	0	0	1	7,952
Logan	2	0	0	0	2	6,048
McHenry	12	0	0	0	12	45,027
McKenzie	12	8	0	0	4	125,638
Morton	1	0	0	0	1	11,212
Mountrail	2	0	0	0	2	15,786
Nelson	2	0	0	0	2	5,157
Renville	10	2	0	0	8	52,017
Stark	3	0	0	0	3	28,572
Walsh	1	0	0	0	1	1,782
Ward	8	0	0	0	8	48,850
Williams	1	0	0	0	1	13,045
Total	135	23	0	0	112	787,738

NORTH DAKOTA
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Billings	7	5	0	0	2	0	62,050
Bottineau	104	80	0	0	24	0	364,555
Burke	84	57	0	0	27	0	571,175
Divide	12	9	0	0	3	0	87,302
McKenzie	86	70	0	0	16	0	820,082
Renville	1	1	0	0	0	0	4,600
Stark	1	1	0	0	0	0	8,970
Williams	12	8	0	0	4	0	133,532
Total	307	231	0	0	76	0	2,052,266

OHIO
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Ashtabula	1	0	0	1	0	3,191
Clinton	1	0	0	0	1	1,983
Coshocton	6	1	0	3	2	22,120
Fayette	1	0	0	0	1	1,920
Holmes	7	3	0	1	3	27,477
Morgan	2	0	0	1	1	9,174
Muskingum	1	0	0	0	1	4,823
Stark	1	0	0	1	0	4,285
Wayne	3	0	0	0	3	11,845
Total	23	4	0	7	12	86,818

OHIO
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Ashland	39	22	0	2	5	10	68,601
Ashtabula	8	3	0	2	3	0	26,104
Athens	31	5	0	17	9	0	42,913
Auglaize	1	1	0	0	0	0	1,262
Carroll	1	0	0	1	0	0	458
Columbiana	9	7	0	0	2	0	7,207
Coshocton	138	92	0	21	25	0	420,661
Cuyahoga	2	0	0	1	1	0	6,301
Fairfield	4	3	0	0	1	0	10,134
Geauga	2	0	0	1	1	0	7,880
Guernsey	5	3	0	1	1	0	6,063
Harrison	6	0	0	3	3	0	7,008
Hocking	23	13	0	0	3	7	60,671
Holmes	69	43	0	15	11	0	222,139
Jackson	4	0	0	2	2	0	7,516
Jefferson	4	1	0	0	3	0	6,424
Knox	28	15	0	6	7	0	59,951
Lake	1	1	0	0	0	0	3,035
Lawrence	2	0	0	1	1	0	5,057
Licking	80	62	0	4	13	1	182,325
Logan	1	0	0	1	0	0	1,880
Medina	22	6	0	2	6	8	64,858
Meigs	31	3	0	24	4	0	41,206

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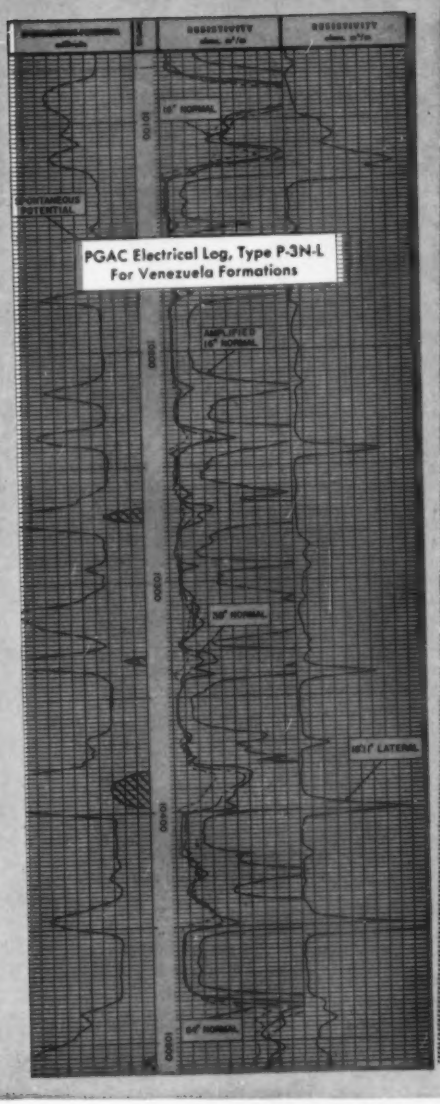

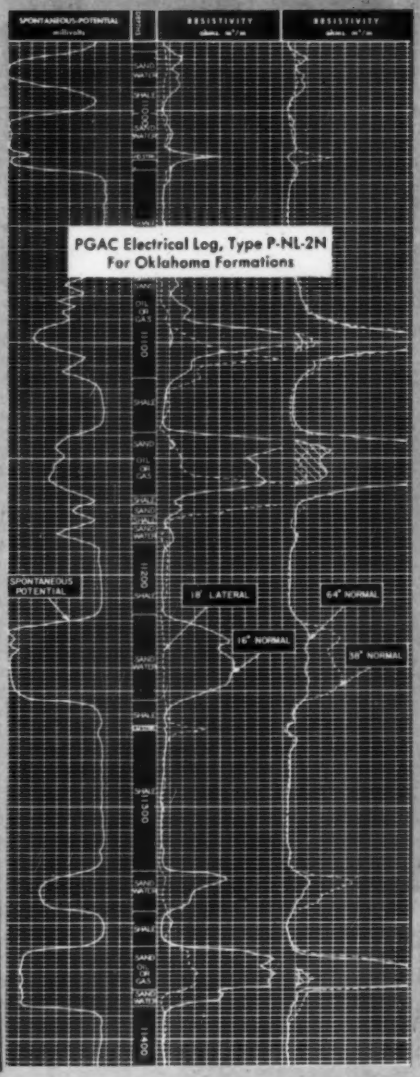

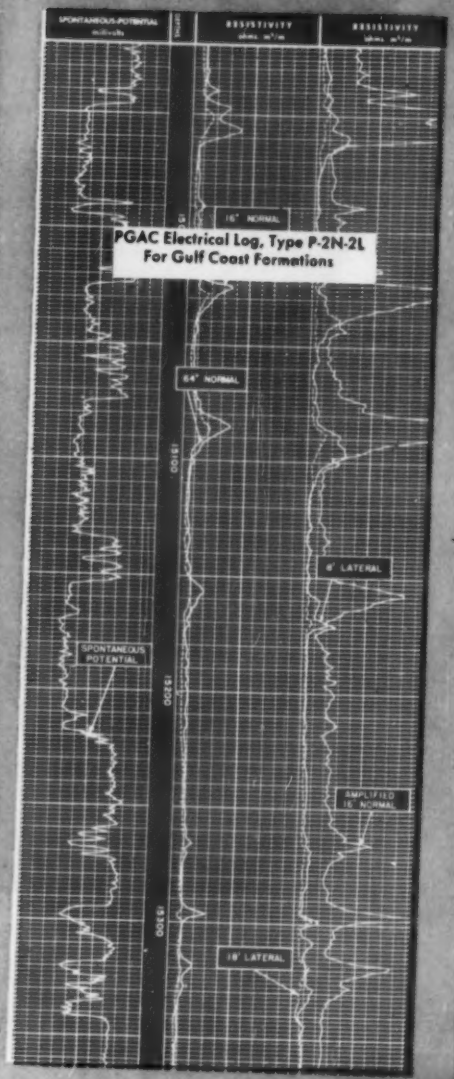

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1958 wildcat and field drilling

OHIO (Continued)

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Monroe	30	9	0	7	14	0	36,554
Morgan	25	0	0	17	8	0	28,053
Muskingum	61	32	0	18	11	0	210,152
Noble	30	5	0	6	19	0	28,343
Perry	83	53	0	15	15	0	261,089
Portage	5	0	0	4	1	0	21,763
Richland	4	0	0	0	0	4	10,956
Stark	14	1	0	10	3	0	58,102
Summit	13	6	0	6	1	0	44,731
Tuscarawas	29	18	0	7	4	0	46,597
Vinton	37	0	0	2	0	35	78,242
Washington	43	17	0	7	19	0	47,068
Wayne	141	77	0	39	25	0	490,203
Total	1,026	498	0	242	221	65	2,621,507

OKLAHOMA
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Alfalfa	22	2	1	1	18	123,725
Atoka	6	0	0	0	6	25,559
Beaver	28	6	2	6	14	211,529
Beckham	7	2	0	1	4	28,123
Blaine	1	0	0	0	1	9,015
Bryan	4	0	1	0	3	16,182
Caddo	8	1	1	0	6	65,311
Canadian	2	0	0	0	2	16,673
Carter	11	1	1	0	9	61,242
Cherokee	1	0	0	0	1	1,450
Choctaw	1	0	0	0	1	1,560
Cimarron	6	2	0	0	4	32,090
Cleveland	29	7	0	0	22	216,617
Coal	4	2	0	1	1	17,757
Comanche	17	2	1	1	13	41,137
Cotton	18	0	0	0	18	42,631
Creek	4	1	0	0	3	15,686
Dewey	1	0	0	0	1	9,080
Ellis	13	0	3	2	8	127,572
Garfield	12	2	0	1	9	57,796
Garvin	19	5	1	1	12	100,462
Grant	27	3	1	2	21	140,792
Greer	8	0	0	1	7	10,142
Harper	21	5	1	3	12	151,269
Haskell	1	0	0	0	1	7,645
Hughes	4	0	0	0	4	8,855
Jackson	1	1	0	0	0	7,700
Jefferson	11	0	0	0	11	32,317
Johnston	2	0	0	0	2	6,980
Kay	35	3	0	2	30	129,165
Kingfisher	6	2	2	0	2	50,483
Kiowa	162	3	0	2	157	129,146
LeFlore	1	0	0	1	0	6,184
Lincoln	15	3	0	0	12	65,095
Logan	20	4	0	0	16	120,161
Love	8	1	2	0	5	51,383
McClain	15	8	0	0	7	143,291
McCurtain	2	0	0	0	2	2,107
McIntosh	3	0	1	1	1	9,782
Major	16	1	1	1	13	125,017
Marshall	12	5	0	0	7	60,860
Mayes	1	0	0	0	1	796
Murray	6	2	0	0	4	17,124
Muskogee	6	0	0	0	6	15,025
Noble	13	3	0	1	9	61,359
Okfuskee	11	5	0	0	6	42,478
Oklahoma	7	2	0	1	4	47,178
Okmulgee	2	1	0	1	0	8,149
Osage	89	11	0	0	78	254,786
Pawnee	18	2	0	0	16	61,058
Payne	10	2	0	0	8	41,717
Pittsburg	1	0	0	0	1	992
Pontotoc	6	1	0	0	5	11,679
Pottawatomie	9	2	0	0	7	51,417
Pushmataha	1	0	0	0	1	5,480
Seminole	6	1	0	0	5	20,069
Sequoyah	1	0	0	0	1	3,504
Stephens	24	6	2	0	16	154,894
Texas	21	5	2	7	7	130,911
Tillman	19	0	0	0	19	51,900
Washita	2	0	0	0	2	30,612
Woods	10	0	1	1	8	59,002
Woodward	7	1	1	2	3	55,516
Total	854	116	25	40	673	3,605,217

OKLAHOMA
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Alfalfa	45	34	1	6	4	0	228,520
Atoka	3	2	0	0	1	0	1,577
Beaver	131	26	18	60	27	0	923,428
Beckham	52	6	0	31	15	0	102,878
Blaine	4	0	2	1	1	0	32,274
Bryan	2	1	0	1	0	0	7,315
Caddo	149	123	0	2	23	1	440,113
Carter	243	164	0	5	74	0	699,929
Cimarron	23	3	0	12	8	0	98,372
Cleveland	99	68	3	4	22	2	765,209
Coal	7	2	1	1	3	0	33,486
Comanche	97	44	1	3	48	1	**141,135**
Cotton	26	9	0	0	17	0	**48,665**
Creek	511	306	0	7	97	101	1,172,992
Ellis	9	0	2	1	6	0	79,732
Garfield	74	44	0	4	26	0	212,304
Garvin	159	90	10	2	55	2	849,166
Grady	38	18	6	1	13	0	275,633
Grant	87	29	7	26	24	1	420,418
Greer	15	0	0	2	13	0	20,078
Harper	67	18	9	28	11	1	446,753
Hughes	98	52	2	8	34	2	187,983
Jackson	1	0	0	0	1	0	1,152
Jefferson	39	22	0	0	17	0	60,596
Kay	119	78	1	2	37	1	444,286
Kingfisher	6	3	0	0	3	0	41,656
Kiowa	476	250	0	4	219	3	294,179
LeFlore	1	0	0	1	0	0	6,297
Lincoln	133	67	6	7	48	5	533,522
Logan	104	68	3	1	31	1	543,187
Love	27	8	4	0	14	1	121,449
McClain	85	60	2	0	23	0	792,047
McIntosh	5	1	0	1	3	0	17,652
Major	14	6	3	1	4	0	100,212
Marshall	41	24	1	0	16	0	138,139
Mayes	2	0	0	0	2	0	2,616
Murray	14	10	0	0	4	0	81,563
Muskogee	11	8	0	0	3	0	21,485
Noble	110	69	1	2	34	4	460,069
Okfuskee	162	103	0	4	49	6	451,880
Oklahoma	54	37	1	3	13	0	323,087
Okmulgee	276	161	0	5	92	18	469,385
Osage	733	440	0	4	202	87	1,710,190
Pawnee	102	54	0	0	35	13	232,522
Payne	112	67	1	3	36	5	386,520
Pontotoc	107	46	0	2	19	40	145,557
Pottawatomie	91	50	0	1	34	6	391,209
Rogers	1	0	0	0	1	0	2,636
Seminole	280	195	0	14	69	2	835,212
Stephens	317	216	4	9	87	1	967,392
Texas	68	14	2	30	22	0	405,000
Tillman	58	39	0	0	18	1	160,238
Washita	1	0	0	1	0	0	6,973
Woods	4	0	2	0	2	0	19,926
Woodward	7	0	4	0	3	0	52,434
Total	5,500	3,135	97	300	1,663	305	17,408,228

SOUTH DAKOTA
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Butte	3	0	0	0	3	8,531
Custer	6	0	0	0	6	8,212
Fall River	3	0	0	0	3	11,939
Harding	1	1	0	0	0	8,645
Jackson	1	0	0	0	1	3,930
Meade	1	0	0	0	1	6,500
Total	15	1	0	0	14	47,757

TEXAS
District 1
Wildcat Completions by Counties

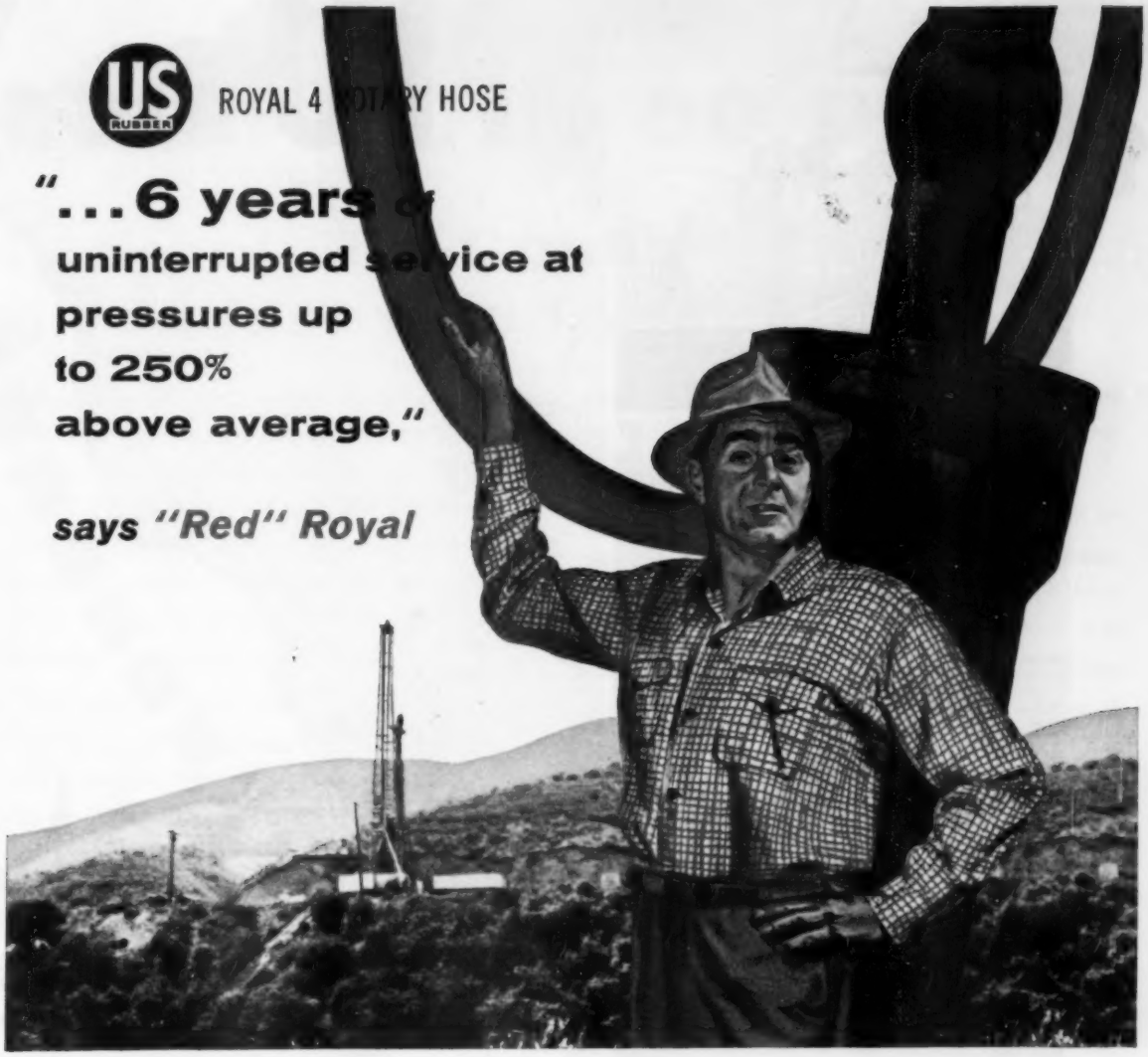
	Total	Crude	Cond.	Gas	Dry	Footage
Atascosa	22	3	0	0	19	84,897
Bandera	1	0	0	0	1	5,105
Bastrop	15	0	0	0	15	37,848
Bell	1	0	0	0	1	1,202
Bexar	9	0	0	0	9	13,450
Burnett	1	0	0	0	1	1,255
Caldwell	6	0	0	0	6	7,864
Comal	2	0	0	0	2	4,778
Dimmit	22	2	0	1	19	88,253
Edwards	4	0	0	0	4	12,178
Frio	11	2	0	0	9	41,518
Gonzales	20	0	0	0	20	71,230

US RUBBER

ROYAL 4 ROTARY HOSE

"...6 years of uninterrupted service at pressures up to 250% above average,"

says "Red" Royal



"Red" is talking about U. S. Royal 4 Rotary Hose performance at Shell Oil Company's field in Ventura, California. This particular hose was installed in 1951. It has handled pressures that often hit 3000 lbs., compared to standard operating pressures of 1200 to 1400 lbs.

What's more, this Royal 4 is one of the most traveled rotary hose in the West, taking all the extra punishment involved in moving around the rough California terrain. Yet, from the day it was put on its first rig, *this Royal 4 has never caused one minute of downtime.*

The hose has drilled over 300,000 feet so far, most of the time carrying oil-base mud. The Ventura field is one of the deepest in California and requires the best hose there is. And that's U. S. Royal 4 Rotary Hose—the hose that takes the highest pressures delivered by today's pumps, with a margin to spare for the pumps to come.

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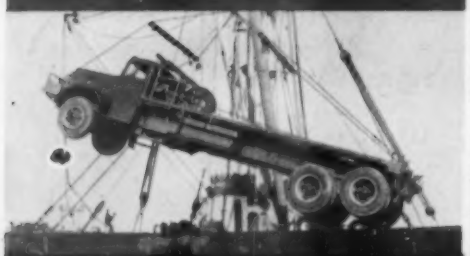
10 RIGS



COMODORO RIVADAVIA

MC2-9

Each Mid-Continent rig will drill under a 126-foot Lee C. Moore telescoping mast. Each rig is capable of drilling to 9,500 feet.

SHIPPED IN 60 DAYS!

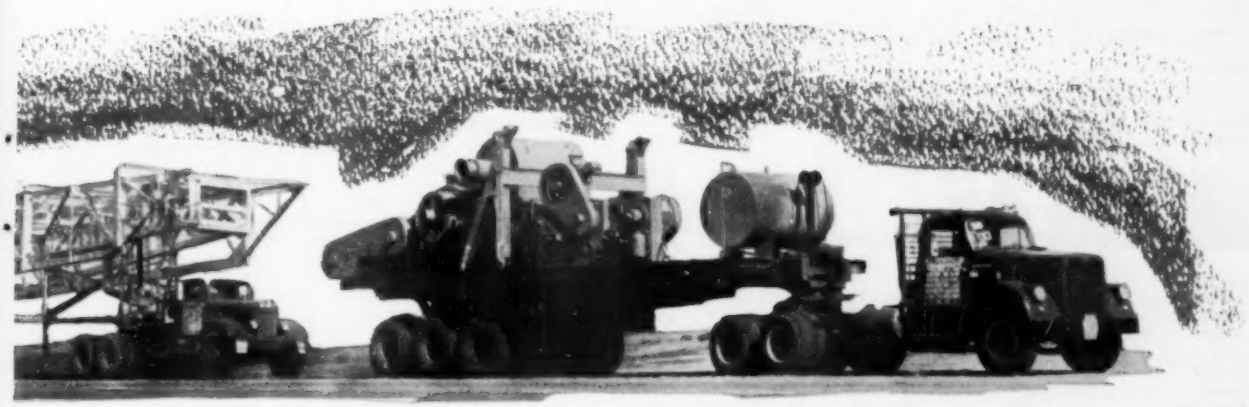
...proof Mid-Continent Supply gives fast world-wide delivery

Ten complete drilling rigs designed, assembled and shipped in 60 days! This was the delivery feat accomplished by Mid-Continent Supply Co. recently for Loffland Brothers Co., who will use the rigs to drill in Argentina. The operator will be Pan American International Oil Co., under a contract with YPF, the Argentine government oil agency.

The rigs, specially designed and equipped for drilling in Argentina, are diesel-powered, fully-portable units mounted on dual trailers. Mid-Continent U-36-A drawworks, rig drives, rotary tables and blocks, Cummins diesel engines, Emsco pumps and Lee C. Moore masts were supplied for each rig by Mid-Continent. Each rig package also included portable mud tanks, drill pipe, rotary hose, wire line, diesel-powered trucks, and hundreds of other items necessary for efficient foreign drilling operations.

This was one of the biggest movements of equipment ever undertaken in the oil business. It was launched with the shipment of three complete rigs just 30 days after Loffland was assigned the drilling contract. The remaining rigs were shipped in groups of four and three at two-week intervals.

The assembly and shipment of these ten complete rigs in 60 days is further proof that Mid-Continent Supply offers fast, dependable delivery of drilling equipment anywhere in the world. For sure service . . . sure supply, wherever you drill, think first of Mid-Continent.



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Export Division: 45 Rockefeller Plaza, New York 20, N. Y. Cable: MIDCUMPORT NYK

THE WORLD'S LARGEST INDEPENDENT OIL FIELD SUPPLY COMPANY

1958 wildcat and field drilling

TEXAS (Continued)

	Total	Crude	Cond.	Gas	Dry	Footage
Guadalupe	13	0	0	0	13	21,662
Kerr	4	0	0	0	4	12,261
Kimble	3	0	0	0	3	8,191
Kinney	4	0	0	0	4	10,016
LaSalle	25	2	0	0	23	58,112
Lee	1	0	0	0	1	4,134
Maverick	70	0	0	0	70	126,242
McMullen	31	1	0	1	29	94,349
Medina	12	0	0	0	12	15,949
Menard	6	0	0	0	6	24,669
Milam	5	0	0	0	5	14,928
Travis	10	0	0	0	10	9,439
Val Verde	9	2	0	0	7	8,717
Williamson	11	0	0	0	11	10,766
Wilson	32	2	0	0	30	61,870
Zavala	17	1	0	1	15	61,632
Total	367	15	0	3	349	912,515

TEXAS
District 1
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Atascosa	72	35	13	7	17	0	387,207
Bastrop	11	8	0	0	3	0	26,230
Bexar	112	92	0	0	20	0	129,579
Caldwell	99	92	0	0	7	0	231,507
Dimmit	27	15	0	0	12	0	102,158
Frio	51	24	0	15	12	0	173,898
Gonzales	8	1	0	0	7	0	14,966
Guadalupe	63	55	0	0	8	0	94,635
Kimble	1	0	0	0	1	0	2,940
LaSalle	17	6	1	2	7	1	88,438
Maverick	14	2	0	0	12	0	17,169
McMullen	48	14	7	7	20	0	193,131
Medina	9	3	0	0	6	0	13,092
Menard	5	3	0	0	2	0	15,068
Milam	14	4	0	0	10	0	20,301
Travis	5	1	0	0	4	0	4,034
Val Verde	2	0	0	0	2	0	867
Williamson	2	0	0	0	2	0	2,305
Wilson	53	33	0	0	19	1	129,654
Zavala	16	6	0	7	3	0	56,247
Total	629	394	21	38	174	2	1,703,426

TEXAS
District 2
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Bee	25	2	0	4	19	121,840
Calhoun	23	3	0	0	20	200,643
DeWitt	11	0	1	0	10	94,838
Goliad	15	0	1	0	14	91,848
Jackson	20	1	0	0	19	157,259
Karnes	9	0	0	0	9	62,198
Lavaca	14	0	5	0	9	116,075
Live Oak	42	3	6	1	32	225,400
Refugio	18	1	2	0	15	119,719
Victoria	19	3	1	4	11	115,372
Total	196	13	16	9	158	1,305,192

TEXAS
District 2
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Bee	67	13	8	24	22	0	355,517
Calhoun	37	12	12	0	13	0	331,072
DeWitt	26	5	8	0	13	0	213,838
Goliad	43	10	12	3	18	0	261,152
Jackson	86	35	16	10	25	0	537,217
Karnes	13	6	3	1	3	0	89,172
Lavaca	23	0	11	3	8	1	173,942
Live Oak	126	66	10	10	40	0	571,043
Refugio	55	19	7	12	17	0	327,791
Victoria	54	16	5	16	16	1	304,489
Total	530	182	92	79	175	2	3,165,233

TEXAS
District 3
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Austin	2	0	0	0	2	16,057
Brazoria	27	2	1	0	24	254,196
Brazos	1	0	0	0	1	6,906
Burleson	1	0	0	0	1	6,843
Chambers	20	0	2	0	18	179,124
Colorado	23	1	3	0	19	194,270
Fayette	3	0	0	0	3	9,122
Fort Bend	16	0	0	1	15	124,601
Galveston	9	1	2	0	6	100,267
Grimes	1	0	0	0	1	2,962
Hardin	21	2	1	1	17	172,670
Harris	18	0	0	0	18	134,790
Jasper	7	1	0	0	6	51,762
Jefferson	27	2	2	1	22	239,686
Lee	1	0	0	0	1	10,213
Liberty	22	0	0	0	22	306,984
Madison	4	1	1	0	2	39,332
Matagorda	18	2	2	0	14	161,866
Montgomery	11	0	0	0	11	75,312
Newton	9	2	1	0	6	72,501
Orange	10	0	1	0	9	85,636
Polk	7	1	0	0	6	52,294
San Jacinto	3	0	0	0	3	28,298
Tyler	4	2	0	0	2	37,624
Waller	3	0	0	0	3	21,679
Wharton	18	0	1	2	15	116,863
Total	286	17	17	5	247	2,501,858

TEXAS
District 3
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Austin	12	0	4	1	5	2	96,642
Brazoria	100	44	5	2	46	3	522,976
Brazos	7	0	0	4	3	0	19,023
Chambers	90	57	14	2	15	2	803,966
Colorado	18	1	9	2	5	1	135,566
Fayette	3	1	0	0	2	0	5,347
Fort Bend	42	17	1	1	23	0	146,754
Galveston	51	24	8	2	17	0	371,295
Hardin	86	51	2	0	33	0	352,062
Harris	148	81	4	4	59	0	695,424
Jasper	8	4	2	0	2	0	55,992
Jefferson	73	26	18	2	26	1	588,456
Liberty	119	79	5	2	32	1	764,905
Madison	2	1	0	0	1	0	11,611
Matagorda	71	18	17	4	31	1	498,778
Montgomery	10	5	2	1	2	0	72,100
Newton	17	12	1	0	4	0	135,932
Orange	25	14	1	1	9	0	150,604
Polk	10	4	5	0	1	0	83,321
San Jacinto	2	0	1	0	1	0	23,394
Trinity	2	0	0	0	2	0	16,716
Tyler	21	19	0	0	2	0	181,251
Walker	1	0	0	0	1	0	7,414
Waller	9	5	2	0	2	0	62,709
Washington	4	0	0	0	4	0	5,950
Wharton	103	30	6	16	50	1	389,132
Total	1,034	493	107	44	378	12	6,197,320

TEXAS
District 4
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Aransas	4	0	1	0	3	36,668
Brooks	14	0	2	0	12	103,581
Cameron	4	0	0	0	4	35,044
Duval	67	2	5	3	57	307,913
Hidalgo	33	0	5	0	28	243,380
Jim Hogg	23	4	0	0	19	91,719
Jim Wells	23	3	0	1	19	122,450
Kenedy	7	0	1	0	6	69,110
Kleberg	13	0	1	0	12	111,322
Nueces	25	4	1	1	19	179,957
San Patricio	30	4	1	0	25	207,872
Starr	47	1	2	0	44	156,444
Webb	41	2	2	1	36	160,271
Willacy	2	0	0	0	2	18,915
Zapata	18	1	3	0	14	71,532
Total	351	21	24	6	300	1,916,178

TEXAS
District 4
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Aransas	5	0	2	0	3	0	44,456
Brooks	23	8	6	4	5	0	139,369
Duval	190	87	7	12	66	18	694,148

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"NEW DIMENSIONS/in electronics and data processing systems"

1958 wildcat and field drilling

TEXAS (Continued)

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Hidalgo	76	10	41	2	23	0	601,274
Jim Hogg	61	31	0	11	19	0	217,106
Jim Wells	74	22	6	13	33	0	372,853
Kenedy	2	0	0	0	2	0	17,658
Kleberg	19	11	4	0	4	0	139,683
Nueces	88	37	3	5	43	0	556,806
San Patricio	88	16	9	10	53	0	523,440
Starr	79	32	11	9	27	0	340,902
Webb	56	14	3	6	32	1	178,232
Willacy	2	0	0	0	2	0	19,033
Zapata	46	15	1	5	22	3	76,485
Total	809	283	93	77	334	22	3,921,445

EAST TEXAS
Districts 5 and 6
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Anderson	49	1	0	0	48	278,701
Angelina	4	0	0	0	4	9,991
Bowie	3	0	1	0	2	22,478
Cass	6	0	1	0	5	28,191
Cherokee	34	0	3	0	31	185,553
Collin	2	0	0	0	2	17,876
Dallas	3	0	0	0	3	1,002
Delta	2	0	0	0	2	6,962
Ellis	3	0	0	0	3	3,250
Fannin	2	0	0	0	2	5,629
Franklin	3	0	0	0	3	19,665
Freestone	28	1	2	0	25	132,434
Harrison	9	0	1	0	8	61,517
Henderson	4	0	0	0	4	19,097
Hill	5	0	0	0	5	7,466
Hopkins	7	0	1	0	6	48,290
Houston	16	0	0	0	16	96,919
Hunt	6	0	0	0	6	23,122
Kaufman	9	0	0	0	9	36,895
Lamar	5	0	0	0	5	10,223
Leon	5	0	1	0	4	31,301
Limestone	6	1	0	0	5	9,026
McLennan	1	0	0	0	1	1,370
Marion	5	1	0	0	4	27,863
Morris	1	0	0	0	1	4,436
Nacogdoches	3	0	0	0	3	19,931
Navarro	9	0	0	0	9	19,090
Panola	3	0	0	0	3	21,621
Rains	1	0	0	0	1	4,157
Red River	17	1	0	0	16	40,631
Robertson	1	0	0	0	1	3,702
Rockwall	1	0	0	0	1	2,042
Rusk	16	2	3	0	11	107,964
Sabine	1	0	0	0	1	6,487
Shelby	6	0	0	0	6	44,269
Smith	26	0	0	0	26	146,399
Titus	1	0	0	0	1	7,669
Upshur	9	0	0	0	9	42,290
Van Zandt	11	1	0	0	10	43,297
Wood	9	0	0	0	9	62,752
Total	332	8	13	0	311	1,661,558

EAST TEXAS
Districts 5 and 6

Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Anderson	44	17	10	0	16	1	257,357
Angelina	1	0	0	0	1	0	5,457
Camp	15	11	0	0	4	0	72,092
Cass	41	29	1	0	11	0	255,507
Cherokee	27	3	6	0	18	0	151,476
Ellis	23	19	0	0	4	0	17,186
Falls	4	2	0	0	2	0	4,688
Franklin	6	5	1	0	0	0	46,275
Freestone	13	5	4	0	4	0	72,100
Gregg	36	29	3	0	4	0	158,832
Harrison	175	139	14	0	21	1	693,783
Henderson	2	1	1	0	0	0	16,276
Hill	3	1	0	0	2	0	3,753
Hopkins	1	1	0	0	0	0	4,778
Houston	11	1	5	1	4	0	65,545
Hunt	1	0	0	0	1	0	3,272
Kaufman	1	0	0	0	1	0	3,452
Leon	8	3	2	1	2	0	42,373
Limestone	8	2	0	0	6	0	30,440
McLennan	1	0	0	0	1	0	475
Marion	48	42	3	0	3	0	278,606
Nacogdoches	4	2	0	0	2	0	20,765
Navarro	153	121	0	1	31	0	164,491
Panola	28	14	4	0	10	0	168,057
Red River	4	0	0	0	4	0	7,977
Robertson	1	0	0	0	1	0	7,220
Rusk	107	71	21	0	15	0	556,310
Shelby	4	1	0	0	3	0	21,942
Smith	51	43	1	0	7	0	395,422
Titus	1	0	0	0	1	0	4,855
Upshur	7	7	0	0	0	0	25,854
Van Zandt	3	0	0	0	3	0	4,393
Wood	56	40	3	0	13	0	334,420
Total	888	609	79	3	195	2	3,895,429

WEST CENTRAL TEXAS
District 7-B
Wildcat Completions by Counties

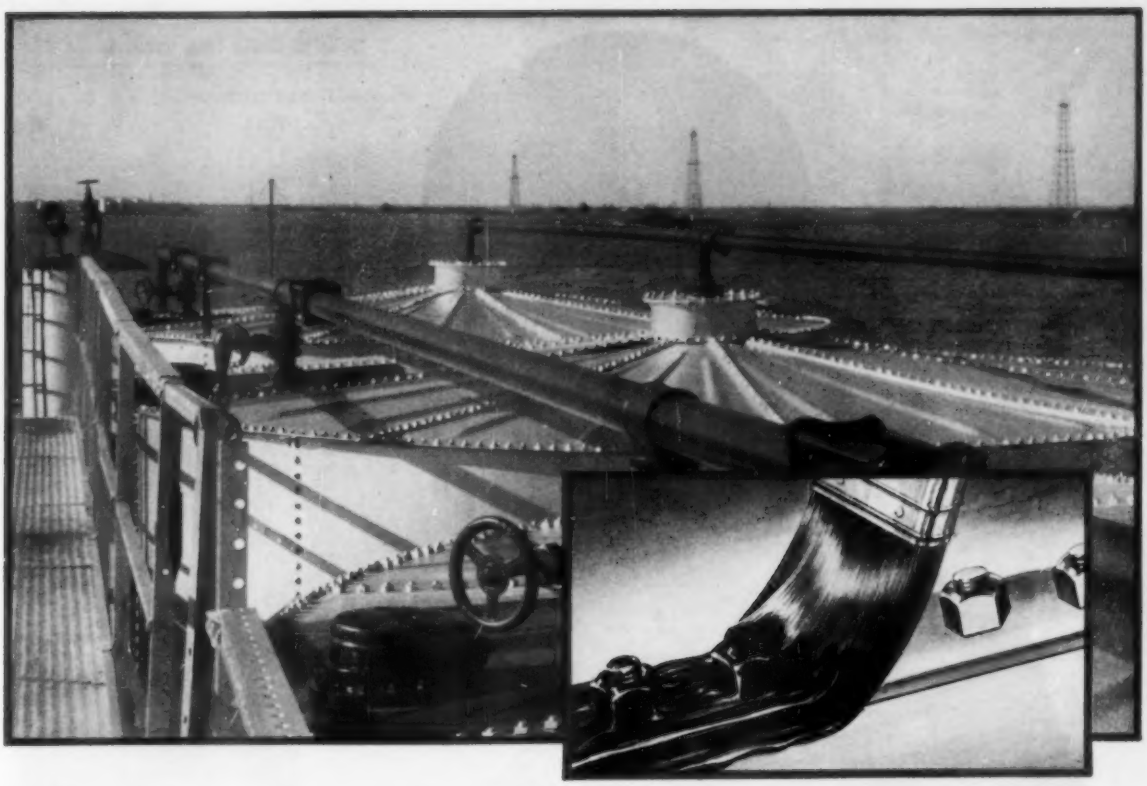
	Total	Crude	Cond.	Gas	Dry	Footage
Bosque	4	0	0	0	4	4,316
Brown	23	0	0	3	20	31,487
Callahan	103	7	0	0	96	219,582
Coleman	40	6	0	0	34	114,169
Comanche	3	0	0	0	3	7,628
Eastland	11	1	0	0	10	37,673
Erath	1	0	0	0	1	3,812
Fisher	18	2	0	0	16	79,099
Haskell	51	9	0	0	42	189,014
Hood	1	0	1	0	0	1,450
Jones	61	4	0	0	57	170,535
Johnson	1	0	0	0	1	1,335
Mills	2	0	0	0	2	7,185
Nolan	37	4	0	0	33	182,649
Palo Pinto	21	7	2	1	11	72,977
Parker	6	1	0	0	5	22,655
San Saba	1	0	0	0	1	1,074
Shackelford	117	15	0	4	98	228,103
Stephens	25	4	1	2	18	105,420
Stonewall	42	6	0	0	36	217,467
Taylor	86	10	0	0	76	305,095
Throckmorton	45	7	0	0	38	153,482
Total	699	83	4	10	602	2,156,207

WEST CENTRAL TEXAS
District 7-B
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Brown	75	44	0	7	23	1	106,002
Callahan	246	121	0	0	112	13	320,145
Coleman	232	143	0	6	72	11	557,221
Comanche	6	0	0	1	5	0	13,026
Eastland	42	21	0	3	14	4	85,661
Fisher	75	54	0	0	21	0	316,643
Hamilton	1	1	0	0	0	0	3,415
Haskell	71	40	0	0	31	0	315,949
Jones	150	97	0	0	47	6	408,048
Nolan	70	48	1	0	21	0	387,520
Palo Pinto	37	20	1	4	12	0	82,491
Parker	30	1	7	12	10	0	128,048
Shackelford	375	218	0	2	143	12	531,369
Stephens	81	44	1	2	32	2	267,925
Stonewall	58	30	0	0	28	0	284,069
Taylor	219	138	1	0	80	0	669,095
Throckmorton	108	62	0	1	44	1	425,347
Total	1,876	1,082	11	38	695	50	4,901,974

WEST TEXAS
Districts 8 and 7-C
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Andrews	15	1	0	0	14	91,090
Bailey	4	0	0	0	4	13,631
Borden	18	6	0	0	12	146,027
Brewster	1	0	0	0	1	1,310
Cochran	10	2	0	0	8	50,891
Coke	10	2	0	0	8	57,733
Concho	4	0	0	0	4	15,696
Cottle	3	0	0	0	3	20,988



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Because THIOKOL *polysulfide rubber shows outstanding resistance to most aliphatic and aromatic solvents, and is relatively unaffected by aging, weathering, sunlight and ozone, it is meeting many critical needs in the petroleum industry. For the full story of how* THIOKOL *polysulfide rubber serves you better, mail the coupon.*

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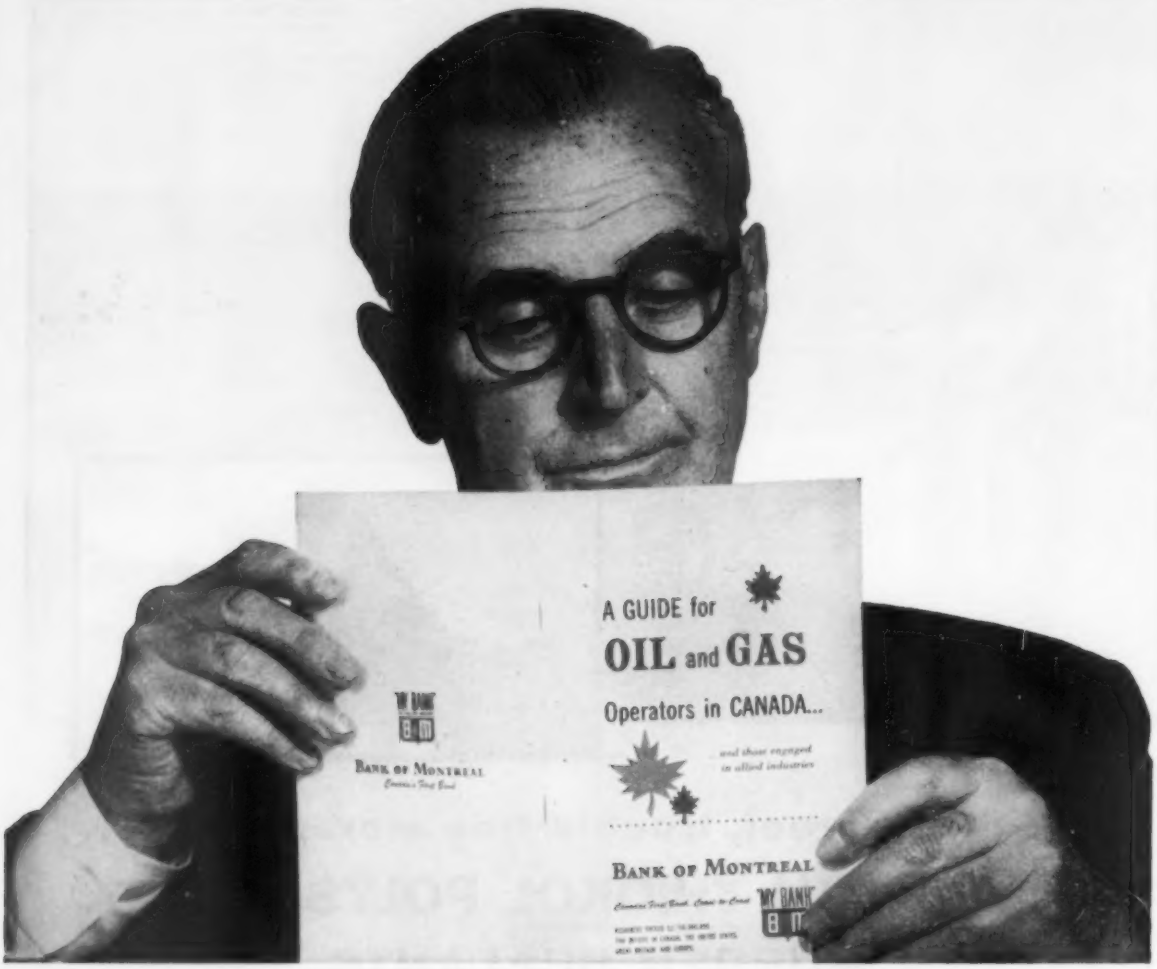

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No Stock Recommendations

While the Bank is prepared to provide all available information on the petroleum industry, it does not make recommendations regarding the purchase of individual petroleum stocks.

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725 BRANCHES ACROSS CANADA • RESOURCES EXCEED $3,000,000,000

1958 wildcat and field drilling

WEST TEXAS (Continued)

	Total	Crude	Cond.	Gas	Dry	Footage
Crane	28	3	0	0	25	123,382
Crockett	22	4	0	0	18	127,570
Crosby	3	1	0	0	2	16,402
Culberson	56	4	0	0	52	127,345
Dawson	6	1	0	0	5	52,685
Dickens	11	1	0	0	10	65,056
Ector	16	4	0	0	12	119,263
Floyd	1	0	0	0	1	9,520
Gaines	15	2	0	1	12	157,856
Garza	23	6	0	0	17	135,224
Glasscock	6	0	0	0	6	35,465
Hale	1	0	0	0	1	8,373
Hockley	16	5	0	0	11	130,789
Howard	7	1	0	0	6	32,378
Irion	14	1	0	0	13	38,037
Jeff Davis	1	0	0	0	1	4,492
Kent	9	3	0	0	6	63,445
King	11	0	0	0	11	48,849
Lamb	9	0	0	0	9	37,651
Loving	37	1	0	0	36	146,166
Lubbock	4	1	0	0	3	31,996
Lynn	12	1	0	0	11	61,768
Martin	4	0	0	0	4	32,007
McCulloch	5	0	0	0	5	9,666
Midland	6	3	0	0	3	57,020
Mitchell	9	0	0	0	9	34,067
Motley	5	0	0	0	5	24,353
Pecos	52	8	2	3	39	247,192
Reagan	4	1	0	0	3	32,810
Reeves	53	7	0	0	46	186,131
Runnels	61	7	0	1	53	229,859
Schleicher	19	3	0	2	14	111,110
Scurry	10	1	0	0	9	57,614
Sterling	12	0	0	0	12	24,560
Sutton	6	0	0	0	6	42,348
Terrell	5	0	0	2	3	61,715
Terry	3	1	0	0	2	30,887
Tom Green	22	5	0	0	17	113,381
Upton	13	0	0	0	13	111,682
Ward	12	3	0	0	9	64,686
Winkler	20	1	3	0	16	121,365
Yoakum	12	2	0	0	10	92,747
Total	706	92	5	9	600	3,656,278

WEST TEXAS
Districts 8 and 7-C
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Andrews	441	412	0	2	27	0	2,926,177
Borden	62	49	0	0	13	0	460,740
Cochran	69	61	3	1	4	0	347,737
Coke	43	40	0	0	3	0	255,129
Concho	3	2	0	0	1	0	12,550
Crane	398	359	1	3	33	2	1,730,977
Crockett	83	58	3	2	17	3	258,871
Crosby	3	3	0	0	0	0	11,428
Culberson	90	76	0	0	14	0	222,372
Dawson	46	41	0	0	5	0	324,736
Dickens	10	5	0	0	5	0	37,496
Ector	515	495	0	2	18	0	3,072,873
Gaines	130	106	0	9	15	0	899,933
Garza	126	106	0	0	20	0	473,345
Glasscock	13	9	1	0	3	0	69,733
Hockley	32	26	0	0	5	1	171,548
Howard	217	196	0	0	20	1	615,991
Irion	23	16	2	0	5	0	64,826
Kent	16	9	0	0	7	0	107,187
King	9	3	0	0	6	0	31,684
Lamb	17	15	0	0	2	0	72,018
Loving	64	56	0	0	8	0	303,110
Lubbock	13	11	0	0	1	1	62,038
Lynn	14	8	0	0	6	0	68,469
Martin	17	15	0	0	2	0	154,621
McCulloch	2	1	0	0	1	0	3,557
Midland	81	73	6	0	2	0	772,708
Mitchell	82	76	0	0	6	0	216,152
Motley	7	2	0	0	5	0	31,869
Pecos	209	144	6	10	35	14	606,536
Reagan	53	50	0	0	3	0	295,035
Reeves	104	94	1	1	8	0	283,050
Runnels	113	64	0	1	38	10	450,190
Schleicher	39	27	1	6	5	0	217,608
Scurry	182	158	1	0	23	0	722,987
Sterling	24	11	0	0	13	0	71,815
Sutton	15	1	9	3	2	0	87,065
Terrell	2	0	0	2	0	0	29,143
Terry	31	28	0	0	3	0	182,469
Tom Green	24	16	0	0	8	0	64,632
Upton	154	145	3	0	6	0	928,311
Ward	250	218	2	3	10	17	745,440
Winkler	535	483	13	0	15	24	2,251,967
Yoakum	86	77	0	0	8	1	606,524
Total	4,447	3,845	52	45	431	74	21,322,647

NORTH TEXAS
District 9
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Archer	71	8	0	0	63	213,669
Baylor	36	1	0	0	35	100,700
Clay	44	3	0	0	41	206,943
Cooke	56	6	0	1	49	187,514
Denton	10	0	0	0	10	21,778
Foard	5	0	0	0	5	33,009
Grayson	12	2	0	0	10	71,881
Hardeman	1	0	0	0	1	8,011
Jack	37	3	0	2	32	135,613
Knox	83	3	0	0	80	206,737
Montague	37	5	0	0	32	175,214
Wichita	15	1	0	0	14	35,579
Wilbarger	64	5	0	0	59	207,704
Wise	25	14	0	3	8	131,180
Young	77	12	0	0	65	281,448
Total	573	63	0	6	504	2,016,980

NORTH TEXAS
District 9
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Archer	546	337	0	0	173	36	1,000,241
Baylor	142	97	0	2	35	8	233,834
Clay	145	88	0	0	53	4	490,989
Cooke	266	186	0	0	58	22	667,867
Denton	10	5	0	0	5	0	17,122
Foard	16	11	0	0	4	1	88,202
Grayson	9	5	0	0	4	0	57,786
Jack	109	67	0	9	33	0	445,036
Knox	175	110	0	0	65	0	382,955
Montague	125	70	0	0	32	23	328,774
Wichita	529	399	0	0	98	32	920,736
Wilbarger	294	174	0	0	80	40	683,154
Wise	270	114	4	123	28	1	1,568,633
Young	376	232	2	2	132	8	1,003,156
Total	3,012	1,895	6	136	800	175	7,888,485

TEXAS PANHANDLE
District 10
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Armstrong	1	0	0	0	1	4,705
Briscoe	3	0	0	0	3	24,694
Carson	6	0	0	0	6	21,681
Castro	2	0	0	0	2	13,632
Collingsworth	1	0	0	0	1	3,335
Dallam	7	0	0	0	7	41,519
Deaf Smith	4	0	0	0	4	34,687
Donley	6	0	0	0	6	26,417
Gray	1	0	0	0	1	2,810
Hansford	14	2	1	2	9	106,160
Hartley	9	0	0	0	9	30,107
Hemphill	3	2	0	0	1	30,795
Hutchinson	2	0	1	0	1	15,525
Lipscomb	18	4	3	0	11	154,109
Ochiltree	20	2	7	3	8	179,073
Oldham	6	0	0	0	6	48,645
Potter	1	0	0	0	1	6,504
Roberts	10	1	0	1	8	83,310
Sherman	7	1	0	1	5	24,928
Swisher	2	0	0	0	2	18,472
Wheeler	3	0	0	0	3	22,491
Total	126	12	12	7	95	893,599

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The MARTIN-DECKER

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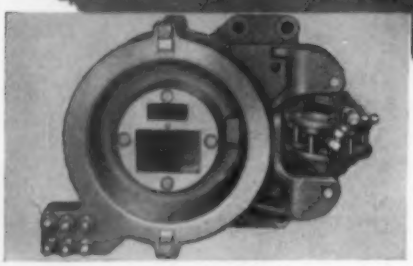
NOW equipped with the Famous

* SENSATER

for greater accuracy and sensitivity



MARTIN-DECKER *is now offering the Type "FS" Weight Indicator with the famous Sensater replacing the piston as the sensing element. This gives the "FS" all the advantages of its bigger brothers—the "E" and "D" Weight Indicators.*

THE SENSATER realizes every weight change no matter how small and relays it instantly to the Indicator mounted conveniently in front of the driller. At medium depths small weight changes are very important and must be known for best operation. It is in the medium range that competition is extremely strong and footage rates cut to the barest margin of profit. A rig operator cannot afford any unnecessary loss of time and must make the best use of all drilling time. The Type "FS" is the best insurance against lost time due to fishing jobs, giving him quick and better recovery. The sensitivity and accuracy in this instrument will give the best use of all drill collars run . . . and faster, better hole.

The anchor installation provides a quick, easy method of slipping the line and because the Sensater is an integral part of the anchor there is no need to move the pressure transformer during the operation — thus preventing one of the major causes of Weight Indicator damage.

The indicator has a net weight on bit pointer and dial that is extremely helpful to the driller in maintaining a constant bit weight. Experience has shown this instrument to be accurate and dependable for many years of trouble-free operation.

THE ANCHOR—The Type "FS" Wire Line Anchor is manufactured by the National Supply Company. It is similar to the "E" and "D" anchors with the exception of being lighter, smaller and designed for side mounting. It provides a simple, convenient method of slipping the line and does not require the removal of the Sensater.

THE SENSATER — The Sensater sensing element in the "FS" is a smaller edition of the one incorporated in the "E" and "D" instruments and offers all the advantages of the larger cell. This new addition to the "FS" instrument makes it even more attractive to the operator who desires a sensitive, accurate weight indication at low cost.

THE GAUGE — The Type "FS" gauge is equipped with a total load pointer and a four-to-one vernier pointer for extra sensitivity. There are also two dials: the inner dial, reading in pounds or kilos, for the total load and the outer dial is adjustable to enable the operator to read the weight on the bit or the net pull on the pipe when fishing or in a tight hole.

***SENSATER—Extra Accurate—Extra Sensitive—Extra Dependable**

Write For Descriptive Literature

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Martin-Decker Weight Indicators and National Wire Line Anchors are sold through the Reed Roller Bit Company, the National Supply Company, and other recognized supply houses, as well as by the Martin-Decker Corporation, 3431 Cherry Avenue, Long Beach 7, Calif.

1958 wildcat and field drilling

TEXAS PANHANDLE
District 10

Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Carson	150	127	0	10	13	0	450,819
Collingsworth	99	0	0	97	2	0	201,765
Dallam	7	0	0	7	0	0	27,879
Donley	4	0	0	4	0	0	11,183
Gray	142	62	0	68	8	4	406,792
Hansford	127	28	55	21	23	0	907,566
Hemphill	9	4	2	2	1	0	70,009
Hutchinson	308	293	0	7	8	0	996,025
Lipscomb	22	3	10	4	5	0	195,783
Moore	31	13	0	11	6	1	103,178
Ochiltree	105	63	21	6	15	0	847,716
Oldham	2	0	0	0	2	0	14,067
Potter	13	0	0	9	4	0	39,270
Roberts	39	12	2	12	13	0	220,718
Sherman	47	1	0	40	6	0	154,503
Wheeler	99	46	0	42	11	0	221,573
Total	1,204	652	90	340	117	5	4,868,846

UTAH
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Box Elder	1	0	0	0	1	2,300
Carbon	2	0	0	0	2	23,590
Duchesne	1	0	0	0	1	8,605
Emery	11	0	0	1	10	46,932
Garfield	3	0	0	0	3	15,968
Grand	6	0	0	0	6	42,763
San Juan	47	1	0	1	45	257,493
San Pete	1	0	0	0	1	9,995
Uintah	8	0	1	2	5	39,397
Wayne	4	0	0	0	4	23,030
Total	84	1	1	4	78	470,073

UTAH
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Emery	1	0	0	1	0	0	5,055
Grand	10	1	0	5	4	0	28,125
San Juan	256	229	0	2	24	1	1,471,520
Uintah	31	24	0	5	2	0	172,451
Washington	1	0	0	0	1	0	4,538
Total	299	254	0	13	31	1	1,681,689

WEST VIRGINIA
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Grant	1	0	0	0	1	3,400
Greenbrier	2	0	0	0	2	11,245
Jackson	3	0	0	3	0	14,720
Kanawha	3	0	0	2	1	14,082
Monongalia	1	0	0	0	1	7,421
Nicholas	2	0	0	0	2	15,112
Pocahontas	1	0	0	1	0	6,167
Preston	2	0	0	2	0	10,576
Putnam	1	0	0	1	0	4,686
Randolph	1	0	0	1	0	5,451
Ritchie	1	0	0	1	0	7,443
Roane	2	0	0	1	1	14,298
Tucker	2	0	0	1	1	13,940
Total	22	0	0	13	9	128,541

WEST VIRGINIA
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Barbour	6	0	0	6	0	0	26,606
Boone	2	1	0	1	0	0	6,810
Braxton	9	0	0	4	5	0	13,973
Cabell	7	0	0	7	0	0	20,262
Calhoun	89	22	0	64	3	0	154,568
Clay	5	1	0	2	2	0	9,997
Doddridge	30	3	0	19	8	0	58,106
Fayette	2	0	0	2	0	0	4,020
Gilmer	16	1	0	12	3	0	30,781
Hampshire	1	0	0	1	0	0	5,532
Harrison	3	0	0	3	0	0	8,175
Jackson	26	16	0	7	3	0	63,595
Kanawha	6	3	0	3	0	0	16,836
Lewis	20	0	0	17	1	2	52,383
Lincoln	11	1	0	10	0	0	35,306
Logan	58	3	0	49	6	0	186,981
Marshall	5	0	0	0	0	5	9,759
Mingo	51	0	0	42	9	0	211,381
McDowell	16	0	0	12	4	0	71,990
Monongalia	5	0	0	4	1	0	8,064
Nicholas	9	0	0	5	4	0	18,466
Pleasants	14	6	0	7	1	0	27,799
Pocahontas	2	0	0	1	1	0	10,452
Preston	1	0	0	1	0	0	4,932
Putnam	17	0	0	16	1	0	67,093
Raleigh	10	0	0	8	2	0	29,168
Randolph	4	0	0	3	1	0	15,567
Ritchie	133	20	0	91	21	1	265,827
Roane	14	11	0	2	1	0	29,929
Tyler	7	0	0	1	6	0	17,890
Upshur	38	0	0	32	6	0	149,478
Wayne	61	2	0	49	10	0	141,943
Wetzel	2	0	0	0	2	0	1,719
Wirt	27	22	0	1	4	0	60,126
Wood	7	2	0	1	4	0	13,734
Wyoming	20	0	0	16	4	0	66,296
Total	734	114	0	499	113	8	1,915,544

WYOMING
Wildcat Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Footage
Albany	10	0	0	0	10	48,743
Big Horn	12	0	0	0	12	33,159
Campbell	15	1	0	0	14	111,060
Carbon	15	1	0	0	14	54,154
Converse	9	0	0	0	9	63,018
Crook	23	4	0	0	19	65,503
Fremont	24	3	0	2	19	92,609
Goshen	5	0	0	0	5	23,705
Hot Springs	9	1	0	0	8	34,126
Johnson	14	0	0	0	14	81,373
Laramie	6	0	0	0	6	41,823
Lincoln	5	0	0	1	4	34,291
Natrona	23	1	0	1	21	115,528
Niobrara	14	0	0	0	14	38,801
Park	7	0	0	0	7	41,673
Platte	1	0	0	0	1	3,449
Sheridan	10	0	0	0	10	71,360
Sublette	12	0	0	1	11	84,591
Sweetwater	24	0	0	7	17	174,458
Teton	2	0	0	0	2	14,227
Uinta	1	0	0	0	1	1,509
Washakie	5	0	0	0	5	23,011
Weston	13	1	0	0	12	47,534
Total	259	12	0	12	235	1,299,705

WYOMING
Development Completions by Counties

	Total	Crude	Cond.	Gas	Dry	Service	Footage
Big Horn	50	31	0	0	19	0	62,978
Campbell	34	27	0	0	7	0	240,243
Carbon	10	7	0	1	2	0	48,158
Converse	31	27	0	0	4	0	133,888
Crook	36	22	0	0	14	0	206,849
Fremont	25	14	0	2	9	0	119,427
Hot Springs	23	18	0	0	5	0	91,080
Johnson	22	13	0	0	8	1	112,313
Laramie	6	2	0	0	4	0	44,340
Lincoln	1	0	0	1	0	0	8,102
Natrona	69	51	0	0	18	0	237,512
Niobrara	9	4	0	0	5	0	18,395
Park	16	12	0	0	4	0	82,299
Sublette	63	14	0	44	5	0	354,852
Sweetwater	8	0	0	6	2	0	46,417
Uinta	2	0	0	0	2	0	2,543
Washakie	29	25	0	0	4	0	258,837
Weston	69	37	0	0	32	0	231,543
Total	503	304	0	54	144	1	2,299,776

Some Reasons Why

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DURAMETALLIC CORPORATION
KALAMAZOO, MICHIGAN

Here are petrochemical expansion plans

• **American Chemical Corp.** (Richfield Oil Corp., Stauffer Chemical Co.) plans to build plant to manufacture chlorinated hydrocarbons in southern California. **C. F. Braun & Co** has preliminary design under way.

• **American Cyanamid Co.** plans facilities for acrylonitrile derivatives at its Fortier plant, Avondale, La.

• **Canadian Industries, Ltd.,** will complete summer 1959, an increase in polyethylene capacity from 22,000,000 lb. to 40,000,000 lb. per year at Edmonton, Alta.

• **Carbide Chemicals Co.** will increase polyethylene to 40,000,000 lb. per year and ethylene glycol to 50,000,000 lb. per year at Montreal East, Que., by April 1959.

• **Celanese Corp. of America** will complete late 1959 a 240,000,000-lb. per year expansion of acetic acid at Pampa, Tex.

• **Continental Oil Co.** will complete fall 1959, a 50% expansion of its carbon-black plant at Ponca City, Okla.

• **Cooperative Farm Chemical Association** will complete August 1959, an increase in ammonia production from 180 to 270 tons per day, and add facilities for 30 tons per day of urea at Lawrence, Kans. **Chemical Construction Corp.** has contract.

• **Devon-Palmer Oils, Ltd.,** and **Texas Gulf Sulphur Co., Inc.,** will complete mid-1959, a $6,000,000, 370-ton per day sulfur plant 12 miles southeast of Calgary, Alta.

• **Diamond Alkali Co.** is considering a $10,000,000, 40-ton per day acetylene plant at Pasadena, Tex.

• **Dow Chemical Corp.** will complete first quarter 1959, an acrylonitrile plant at Freeport, Tex. Polyethylene facilities under way will go on stream June 1959.

At Bay City, Mich., facilities to manufacture ethylene and butadiene from refinery streams will be completed in 1959. By October 1959, multimillion-dollar polyethylene facilities will be added.

• **Du Pont, E. I., de Nemours & Co.** will complete mid-1959, acetal resin facilities at Parkersburg, W. Va.

At Orange, Tex., a linear polyethylene plant will be completed by mid-1960.

At Beaumont, Tex., a 50,000,000-lb. per year caprolactam unit will be completed third quarter 1960.

• **Du Pont of Canada, Ltd.,** will complete in 1959, a linear polyethylene resin plant at Sarnia, Ont.

• **Firestone Tire & Rubber Co.** will expand butadiene capacity 20,000 tons at Orange, Tex.. in 1959.

• **Foster Grant Co., Inc.,** is expanding styrene capacity to 105,000 lb. per year at Baton Rouge. La.

• **Goodyear Tire & Rubber Co.** will complete March 1959, a $9,000,000 plant to manufacture polyester resins (unofficially reported as dimethyl terephthalate-dimethyl isophthalate) at Point Pleasant, W. Va.

• **Grace, W. R.. Co.,** Dewey and Almy Div., is building a $4,000,000 plant to manufacture styrene-butadiene latices at Owensboro. Ky.

• **Grace, W. R., & Co.,** Grace Chemical Div., plans to expand capacity of urea facilities to 75,000 tons per year at Woodstock, Tenn.

• **Great Western Producers, Inc.,** plans to add a Udex unit to make pure benzene, toluene, and xylenes at Irving, Tex.

• **Gulf Oil Corp.** will complete early 1959, UOP facilities for 30,000,000 gal. per year of benzene in a $6,800,000 project at Port Arthur, Tex.

• **Humble Oil & Refining Co.** will complete late 1959, a polypropylene plant at Baytown, Tex. Initial capacity of 40,000,000 lb. per year can be expanded to 100,000,000.

• **Koppers Co., Inc.,** Plastics Div., plans to double polyethylene capacity at Port Arthur, Tex.

• **Lion Oil Co.,** Div. of Monsanto Chemical Co., will complete early 1960, a propylene tetramer unit at El Dorado, Ark.

• **National Petro-Chemicals Corp.** will complete early 1959, a 75,000,000-lb. per year polyethylene plant on the Houston Ship Channel.

• **Ohio River Chemical Co.** (Spencer Chemical Co. and Industrial Rayon) will complete late 1959 or early 1960, a $10,000,000, 20,000,000-lb. per year caprolactam plant near Ashland, Ky.

• **Petroleum Chemicals, Inc.,** is considering a $17,000,000, 30,000-ton per year butyl rubber plant at Lake Charles, La.

• **Polymer Corp., Ltd.** (Crown owned), will build a $15,000,000 butadiene plant with estimated capacity at 25,000 to 30,000 tons per year at Red Deer, Alta.

• **Reichhold Chemicals (Canada)** plans a phenol and formaldehyde unit at Port Moody, B. C.

• **Reichhold Chemicals, Inc.,** is doubling capacity of formaldehyde at Tuscaloosa, Ala. A $1,500,000 program is under way to expand production of phenol from benzene, with completion slated for 1959. Another $1,500,000 program is under way to expand production of pentaerythritol from formaldehyde and acetaldehyde.

At Kansas City, Kans., a formaldehyde plant will be completed first quarter 1959. Capacity of the $500,000 plant will be 30,000,000 lb. per year.

• **Shell Chemical Corp.** will complete late 1959, facilities to acrolein and 35,000,000 bbl. per year of glycerine at Norco, La. Cost is estimated at over $10,000,000.

At Houston, a phenol unit will be completed late 1959, by **M. W. Kellogg Co.**

• **Sinclair Chemicals, Inc.,** will complete first quarter 1959, a $6,000,000, 50,000,000-lb. per year paraxylene plant at Houston. It will produce 60,000,000 lb. per year of pure toluene and xylenes.

• **Standard Oil Co. of California** has under way a $1,750,000 polybutene expansion program at Richmond, Calif.

(Continued on page 219)

REFINING . . .

A complete report of U. S. and Canada refining construction will appear in your March 30 issue, along with the Journal's Annual Survey of Refining Operations.

HUDSON SERVES THE URANIUM INDUSTRY

In Ontario, Canada, near the northern shore of Lake Huron, Hudson Engineering (Canada) Limited has recently completed the construction of a major uranium ore mining and milling project for Stanrock Uranium Mines, Limited. Located in the Blind River area, which contains the free world's largest reserve of uranium, the design quantity of 3,000 tons per day is being mined and milled, uranium oxide being the end product.

The experience of Hudson in design and construction for the oil, gas, chemical and mineral industries is available for any size project anywhere in the world.

DESIGNERS AND CONSTRUCTORS OF PROCESS PLANTS FOR THE MINERAL, CHEMICAL, OIL AND GAS INDUSTRIES

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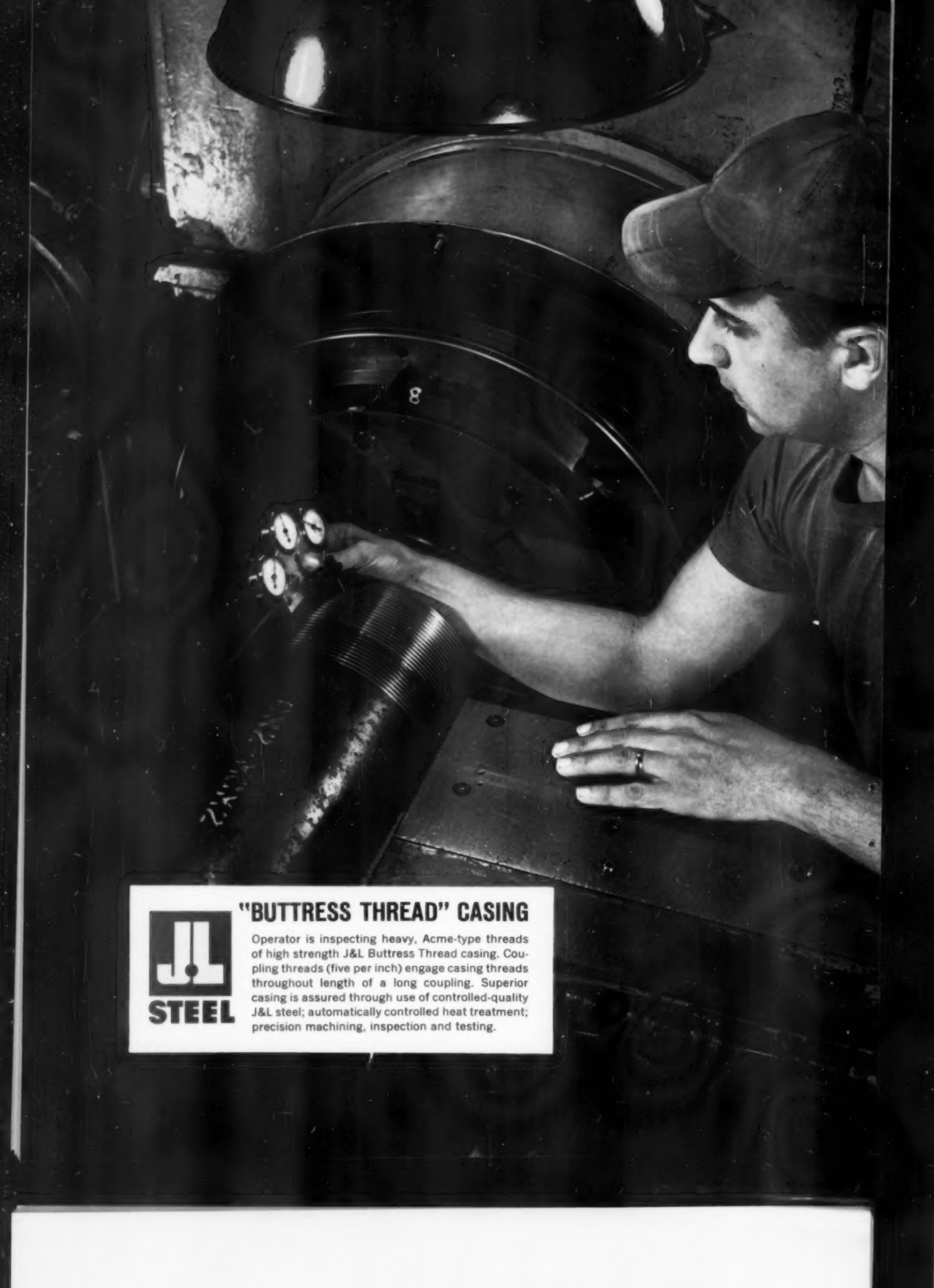
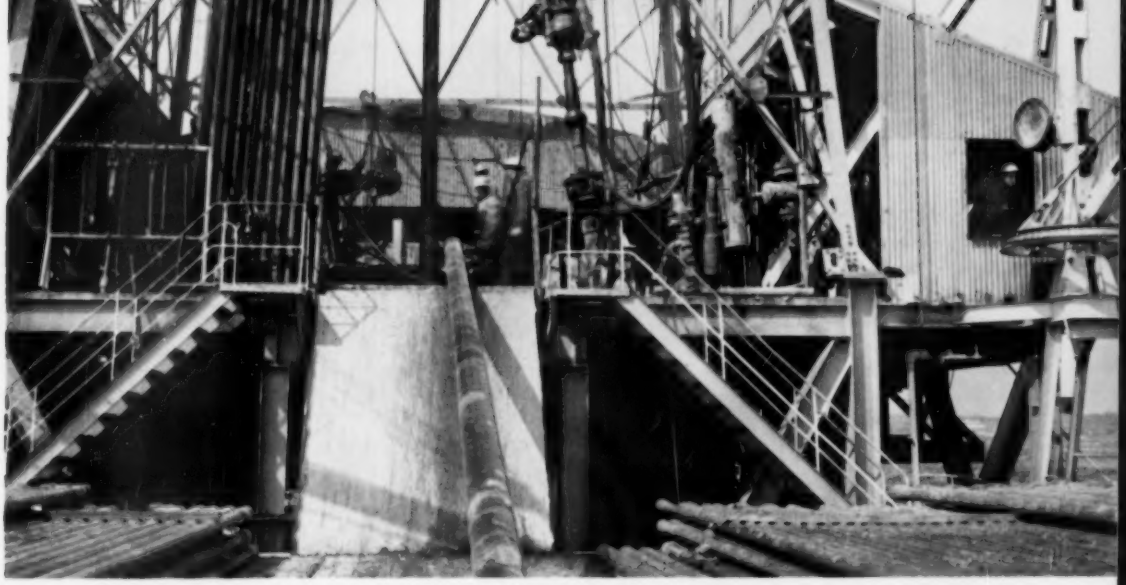


J&L STEEL

"BUTTRESS THREAD" CASING

Operator is inspecting heavy, Acme-type threads of high strength J&L Buttress Thread casing. Coupling threads (five per inch) engage casing threads throughout length of a long coupling. Superior casing is assured through use of controlled-quality J&L steel; automatically controlled heat treatment; precision machining, inspection and testing.



Bell Isle Corporation No. 43 well, located southwest of Morgan City, Louisiana.

"High strength J&L Buttress Thread casing in top sections permits running a longer, heavier intermediate string"

... says Sun Oil drilling superintendent

Sun Oil used 5813 feet of Buttress Thread casing in the top sections of the 9⅝" casing in this Bell Isle Corporation No. 43 well near Morgan City, Louisiana.

"The high strength J&L Buttress Thread casing was used so a much longer and heavier intermediate string could be run," according to the drilling superintendent.

"The top 2297 feet of 9⅝" casing was 47 lb. N-80, R-3 J&L Buttress Thread. The next 3516 feet of 9⅝" casing was 43.5 lb. Buttress Thread."

High strength of Buttress Thread is attained by combined effect of completely engaged runout threads and the three-degree flank angle of the thread.

Easy stabbing, rapid spinning and fewer power strokes to pull the coupling up to the power-tight position are provided by the unique thread design.

J&L Buttress Thread casing is available in J-55, N-80, P-110 grades, and in higher grades when required.

Specify Buttress Thread casing for severe and variable drilling operations. Write for information from Jones & Laughlin, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

Top 5813 feet of 9⅝" casing in this new well was high strength J&L Buttress Thread casing. Well was drilled to 14,320 feet by the Sun Oil Company. Diesel Electric Drill Barge No. 2 handled the job.

J&L STEEL

The exciting new J&L

Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA

(Continued from page 214)

• SunOlin Chemical Co. (Sun Oil Co.

Houdry means Progress

... through Catalysis

Houdry has had 30 years of continuous activity in the development and design of catalytic processes and catalysts. It has accumulated experience, know-how and facilities unmatched in its field.

Whenever problems arise concerning catalysis, Houdry is in a position to provide the best possible solutions—because Houdry—

- Designs and licenses catalytic installations throughout the world
- Manufactures and supplies a variety of catalysts for established processes, as well as special purpose catalysts tailored to specific individual requirements.
- Provides technical service to assist in selection of catalysts and operation of processes
- Offers contract research to assist in the development of individual processes and products . . . through catalysis

Today, Houdry is accelerating the development of new and improved catalytic processes and catalysts for even more efficient—and profitable—processing than ever before.

In solving the many catalytic problems brought to us, we may already, in essence, have solved yours. Consult with us.

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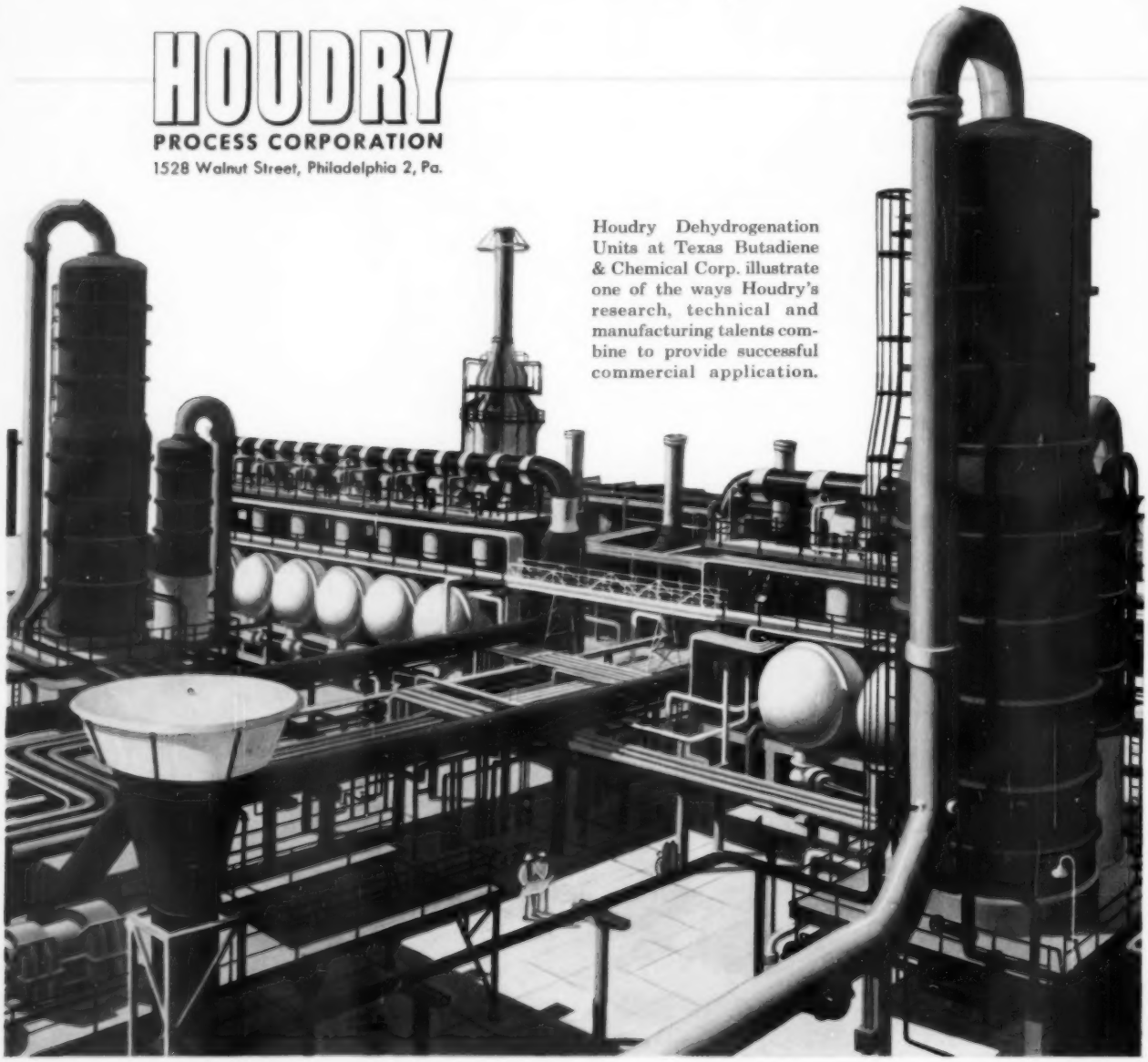


Houdry Dehydrogenation Units at Texas Butadiene & Chemical Corp. illustrate one of the ways Houdry's research, technical and manufacturing talents combine to provide successful commercial application.

(Continued from page 214)

• **SunOlin Chemical Co.** (Sun Oil Co. and Olin Mathieson Chemical Corp.) will complete early 1960, a 73,000-ton per year urea plant at Marcus Hook, Pa.

• **Union Carbide Chemicals Co.** will complete mid-1959, a second oxo unit to double oxo chemicals capacity at Texas City, Tex.

At Whiting, Ind., a 72,000,000-lb. per year polyethylene plant is being built.

In Puerto Rico, near Guayanilla, new ethylene oxide-glycol facilities are being built.

At Marietta, Ohio, capacity of 15,000,000 lb. per year will be added to the epoxy plant by early 1959.

At Institute, W. Va., expansion of epoxide capacity will be completed mid-1959.

Here's growth of field processing

• **Arkansas Louisiana Chemical Corp.** plans to complete mid-1959, a $3,000,000, 300-M.M.c.f.d. plant at Magnolia, Ark. It will extract 78,000 gal. daily of ethane.

• **Canadian Fina Oils, Ltd., Pan American Petroleum Corp.,** and **Hudson's Bay Oil & Gas Co.** will build a $3,000,000 to $3,500,000 cycling plant in the Windfall gas field near Whitecourt, Alta. Canadian Fina will operate the 30-M.M.c.f.d. plant which will strip natural gasoline, butane, and propane.

• **Champlin Oil & Refining Co.** will complete July 1959, a $3,000,000 modernization and expansion program at its plant near Bishop, Tex. **Fluor Corp., Ltd.,** has contract for engineering and construction of the project which will upgrade all products and increase production of ethane, butane, and propane.

• **Humble Oil & Refining Co.** is building a cycling plant in Kleberg County, Tex., 15 miles south of Kingsville. Capacity will be 300 M.M.c.f.d., and 25,000 bbl. daily of liquid products will be recovered. Completion is slated for mid-1960.

• **Magnolia Petroleum Co.** will complete April 1959, a 150-M.M.c.f.d. absorption-refrigeration type plant at Cameron Meadows, La., 60 miles south of Lake Charles. It will produce about 4,500 bbl. daily of distillate.

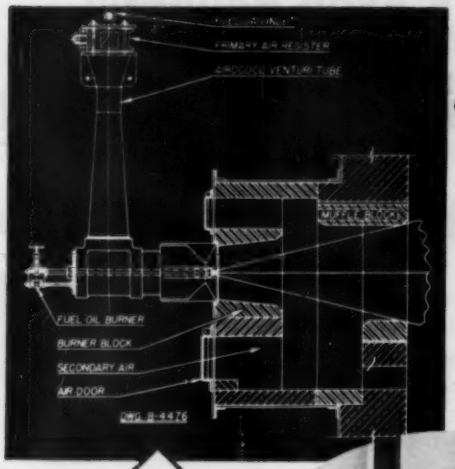
• **Runnels Gas Products Corp.** and **Texas Gas Exploration Corp.** will increase capacity at Eunice, La., by 69 M.M.c.f.d. by April 1959. **Fluor Corp, Ltd,** has the $500,000 contract

• **Shell Oil Co.** is building a refrigeration-type plant at Little Creek, Miss., gas field. Initial capacity of the Pike County plant will be 5 M.M.c.f.d. It will extract 15,000 gal. daily of natural gasoline and propane.

At Weeks Island field in La, a 120-M.M. c.f.d. plant will be completed in 1959.

• **Sun Oil Co.** et al. (Pan American Petroleum Corp., Sinclair Oil & Gas Co., Cities Service Oil Co., Shell Oil Co., Union Oil Co., Oklahoma Natural Gas Co., Kerr-McGee Oil Industries, Inc., Anderson-Prichard Oil Corp.) plant to complete July 1959, a 100-M.M.c.f.d plant at Laverne field, Okla. It will extract 100,000 gal. daily of liquids Sun Oil will operate the plant.

• **Warren Petroleum Corp.** and **Sunray Mid-Continent Oil Co.** plan to start construction March 1959 on a 100-M.M.c.f.d. plant near Mocane pool in Beaver County, Okla. It will be the refrigeration-absorption type, with liquid output of 100,000 gal. daily. Warren will operate the $3,000,000 plant. **Dresser Engineering Co.** of Tulsa, expects to complete the plant by September 1959.



Firing

CRUDE DISTILLATION UNIT HAVING WORLD'S HIGHEST THRUPUT...

NATIONAL AIROIL

OIL-GAS TANDEM COMBUSTION UNITS

Looming large in the effort to meet increased products demand on the petroleum industry is Tidewater Oil Company's ultra-modern Delaware Refinery, for which C. F. Braun & Co. were the engineers and constructors.

At the Tidewater Oil Company's ultra-modern Delaware City refinery this huge crude furnace for a world's record capacity of 130,000 barrels per day is equipped with National Airoil Burner Company's exclusive Tandem Block Combustion Units which are easily capable of exceeding the designed capacity of the furnace when burning either liquid or gaseous fuels.

These Tandem Units will burn up to high viscosity residuum oils and/or varying molecular weights of refinery gases. They have high individual heat liberating capacity as well as turn down ratio on natural draft thus avoiding the cost of a blower system. They will operate with low excess air.

Because these high combustion efficiency Tandem Units liberate a large proportion of heat by flame radiation to the heat absorbing surfaces, they increase the days on stream by reducing flame impingement with its accompanying high maintenance cost to tubes, brick work, etc.

National Airoil

BURNER COMPANY, INC.

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at Tidewater's Avon Refinery:

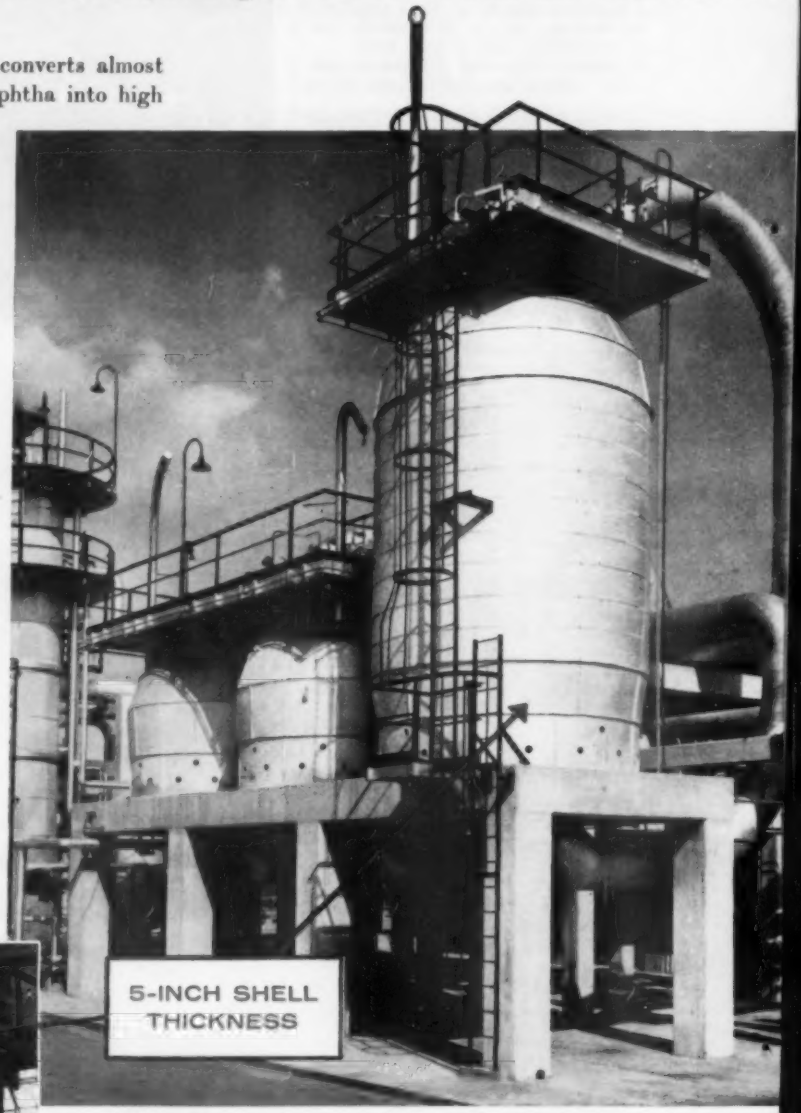
.....CB&I—built reactors serve 1,000,000-gal. HOUDRIFORMER Process....

This high severity catalytic reformer unit converts almost a million gallons per day of low octane naphtha into high octane blending stocks.

The three CB&I-built reactors incorporated in the process handle upwards of 127,000 pounds of platinum catalyst per charge. They were fabricated of plates up to 5 inches thick . . . to meet the rigid specifications dictated by extremely high and controlled temperature and pressure conditions. In addition, the critical vessels were shop X-rayed and stress relieved to insure optimum performance and long service life.

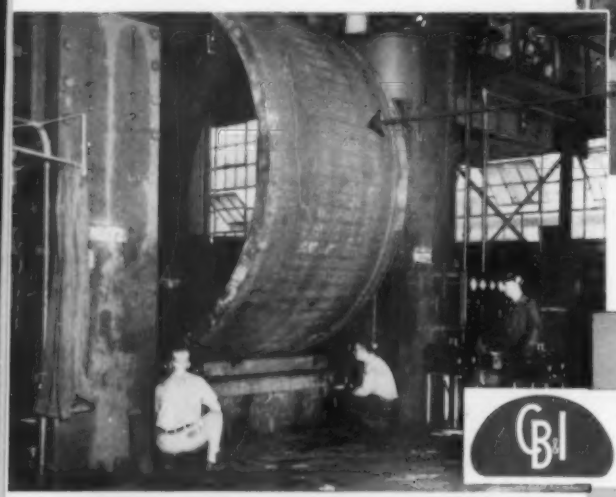
Fabricating 5-inch plate to customer or code specifications is not an unusual job for CB&I. Increased complexity in refining operations demands the exacting attention to detail made possible by CB&I's advanced metallurgical facilities.

Creative fabrication, combined with experienced and *coordinated* engineering and erection services is the reason leading processors rely on CB&I for the tanks, towers and processing vessels which help to keep them abreast of petroleum progress. Write our nearest office for the bulletin: *CB&I Creative Craftsmanship in Steel.*



CB&I-built reactors contain catalyst for *Houdriformer*—high severity reforming process. Hydrogen by-product, generated in process, is recovered for use in another process that removes nitrogen and sulfur compounds from gasoline and propane.

Reactors were furnished through the Bechtel Corporation.



Five-inch thick plate for walls of large reactor (shown above) was fabricated at CB&I Birmingham plant.

Chicago Bridge & Iron Company

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179CB

Cost of operating vacuum distillation units (lubes)

BY W. L. NELSON
Technical Editor and Petroleum Consultant

DISTILLATION in vacuum for lubricating oils is not basically different from vacuum flashing (see comments of Process Costimating No. 35, Dec. 15, 1958, p. 108). However, two or more products are usually produced from a single tower, and this causes the pressure loss from the barometric condenser to the feed plate to be larger (8 to 15 mm. usually under 1.5 mm. per plate at lowest pressures). In addition, the side-draw products may be stripped with steam in order to obtain satisfactory flash points. Finally, it is often desirable to vaporize as high-boiling material as possible and this leads to higher steam consumptions, lower pressures and larger consumptions of cooling water. The literature offers scarcely any cost information although one reference suggests the low cost of only 8.4 to 9.8 cents (1956) per barrel. Table 1 outlines the cost elements involved in vacuum distillation.

For every cooling-water temperature and every charge stock there is a most economical consumption of steam (both jet and process) and this subject was discussed in Process Costimating No. 37, January 12, 1959, p. 98. The temperature of the water leaving the barometric condenser is the most important factor:

Outlet water °F.	Approx. optimum pressure, mm. Hg
65	23 plus Δp*
75	32 plus Δp*
80	36.5 plus Δp*
85	42 plus Δp*
90	50 plus Δp*

*Pressure drop between barometric and vaporizer.

Apparently, only one complete discussion of vacuum distillation appears in the literature, that of W. A. Peters, Science of Petroleum, Vol. II, pp. 1,600-1,603 (Oxford Univ. Press, N. Y., 1938).

TABLE 1—ELEMENTS OF OPERATING COSTS (VACUUM DISTILLATION FOR LUBES).

Element	Unit (somewhat standard)	1956 unit cost	For 5,000 BPD plant, cts. per bbl.	See Process Costimating No.
Labor—supervision	0.7 men per 8-hour shift*	$3.85 per hour†	0.43-2.58*	26, 28, 41
Labor—operating	3.3 men per 8-hour shift*	$3.12 per hour†	1.63-9.90*	
Maintenance	3-4% per year of replacement	$125-325 per daily bbl.‡	1.53-2.04	29
Fuel	55,000-85,000 B.t.u. per bbl§	20-40 ct. per MM B.t.u.	1.55-5.75	3, 4, 6, 30
Power	0.0044-0.008 brake hp. per bbl..	21.6 ct. per day per hp.¶	0.09-0.17¶	13, 14, 21-23, 36
Cooling water:				
Products and jet steam	256-910 gal. per bbl.	1.7 ct. per M gal.	0.43-1.50	15, 16, 38
Main barometric	106-3,420 gal. per bbl.	1.7 ct. per M gal.	0.18-5.80	
Steam‖:				
40% vaporized	16-180 lb. per bbl.** (56)	45-60 ct. per M lb.	0.7-10.8	17, 18, 31, 33, 34, 37
60% vaporized	18-220 lb. per bbl. ** (85)	45-60 ct. per M lb.	0.8-13.2	
70% vaporized	20-260 lb. per bbl.** (100)	45-60 ct. per M lb.	0.9-15.6	
Total direct cost (probable extremes)			9-33	
Laboratory control	0.3-0.5 men per 8-hour shift	$3.12 per hour†	0.10	
Obsolescence, insurance, taxes and interest (75% per year of replacement)			3.57	
			3.67	

*Small independent refiners use about one-third as many men, whereas majors use about twice as many as shown here.

†Average U. S. wages including 27% for all burdens.

‡For size range of 600 to 10,000 bbl. per day. The cost of a 5,000-bbl. per day plant is $166 per daily barrel.

§Heat absorbed, which must be devised by thermal efficiency of the pipe-still heater.

¶For electricity at 9 mills. Steam-driven pumps could increase the cost ten-fold. Pump efficiencies are somewhat low (50-70%) because of high viscosity.

‖Additional steam may be used to drive pumps that are considered here to be motor driven (see Power item).

**Based on 75° F. water outlet temperature for barometric condensers. Water temperature has little effect at higher pressures but at the lowest pressures, the use of 65° F. water reduces the (largest) steam consumption by about 50% whereas 85° F. water requires about 50% more steam. Ranges of steam consumption are caused mainly by boiling range (mid boiling points of 800°-1,000° F.). The use of about half process and half jet steam is often most economical (see p. 255 of fourth edition of Petroleum Engineering, McGraw-Hill Book Co., Inc., N. Y., 1958). Also included is stripping steam (0.3-0.6 lb. per gal.) for 75% of the products. The numbers in parentheses are thought to be average steam consumptions.

Note especially that the steam consumption of jets ranges (because of varying amounts of dissolved gases) from minus 40% to plus 160%. Inasmuch as half jet steam is contemplated, the steam quantities can vary by minus 20 to plus 80% because of variations in jet steam.

HCSmith 3-CUTTER ROCK BITS

COMPTON, CALIF. • ODESSA • HOUSTON • DALLAS • OKLAHOMA CITY • GREAT BEND • EDMONTON

THESE TWO Italian-built trailer-mounted rigs are shown while set up for checking prior to shipment to YPF in Argentina. They are the first completed of YPF's 20-rig order.

Italian-built rigs move to Argentina

THE FIRST 2 of 20 identical rigs being mass-produced in Florence, Italy, by Nuovo Pignone por YPF (Argentine Government oil fields) are now on their way to the South American country. Shipment of the remaining rigs of the order will follow at intervals over a period of several months.

The 20 rigs, all Ideco's H-40 Dual-Ramblers with 111-ft. Kwik-Lift masts, are duplicates of 10 other rigs Ideco built for YPF at Beaumont, Tex., in 1957, and now operating in Argentina. Nuovo-Pignone, the Italian company, is one of five European manufacturers licensed by Dresser, A. G., to build Ideco drilling equipment.

All 20 rigs will operate in Argentina's Comodoro Rivadavia field, where the first 10 rigs, built in 1957, now are located. They will give Argentina the largest concentration of identical rigs operating anywhere in the world.

Before shipment, the two rigs were set up completely, tested, and checked out. They then were securely weatherproofed and strapped for the long ocean voyage.

The rigs are trailer-mounted and have a nominal drilling-depth capacity of 7,500 ft. Each has separate trailers for mast and hoist. They are quickly coupled over the well site. Their savings in rigup time have reduced average well time in the Argentine field from 45 to 15 days.

Mast trailer carries, in addition to the mast, the rotary table, substructure, pipe-ramp walk, traveling block with permanent stringup, and a reel with extra drilling line. The drawworks trailer carries an H-40 Hydrair hoist, driller's control panel, 2-shaft chain compound, and two Caterpillar diesel-power units of 248 hp. each.

Each rig has an independent pump drive, using 600-hp. duplex mud pumps and torque-converter-equipped diesel engines, unitized, with chain drives and oil-bath guards, on skids.

In the Argentine field the rigs are called upon to withstand persistent 100-m.p.h. winds.

New drilling record for 8-hour shift

A NEW drilling record for an 8 hour shift is believed to have been set by an Indian and British crew in northeastern India.

The 10-man crew on Assam Oil Co.'s 38 Nahorkatiya logged 2,393 ft. in the 8-hour period. This beat by 88 ft. the previous record of 2,305 ft. made in a well in the Los Angeles Basin of California.

The feat was accomplished during

"SCOT" FORGED SEAMLESS RING GASKETS

MINIMUM HARDNESS

For ring Groove Flanges forged from reforging billets in the following materials in stock: Soft Steel, Copper, Aluminum, Inconel, Monel, Nickel; 1¼ Cr ½ Mo., 2¼ Cr 1 Mo., 9 Cr 1 Mo. 304, 310, 316, 321, 347, 405, 410, 430, 502.

Machined in all A.P.I. — A.S.A. Special sizes and other type.

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Koenig ALL-STEEL SERVICE BODIES

FOR ALL 1/2-, 3/4- and 1-TON TRUCKS

Each body electrically welded into one unit with bed reinforced. Sturdy and economical . . . . weatherproof compartments with recessed paddle-handle door locks.

Write for literature on service bodies, line-construction bodies, side boxes, and King Winches.

KING WINCHES

A-11 King Winch on A-128 (4 x 4) International truck. There's a front-mount King Winch designed to fit your specific needs . . . for ½-ton through 2½-ton trucks . . . pulling capacities of 8,000 to 19,000 lbs.

P. T. O.-driven King Winch on Willys Jeep FOR ALL WILLYS JEEPS, 4 WD TRUCKS AND 4 WD STATION WAGONS. Power-take-off-driven King Winch models 130J and 131J for CJ-3B and older-model Jeeps, can be transferred to CJ-5 and CJ-6 Jeeps . . . nothing extra needed.

King Winches for International trucks available through International dealers.

Koenig cabs and King Winches for Willys vehicles available through all Willys dealers.

Koenig IRON WORKS, INC.
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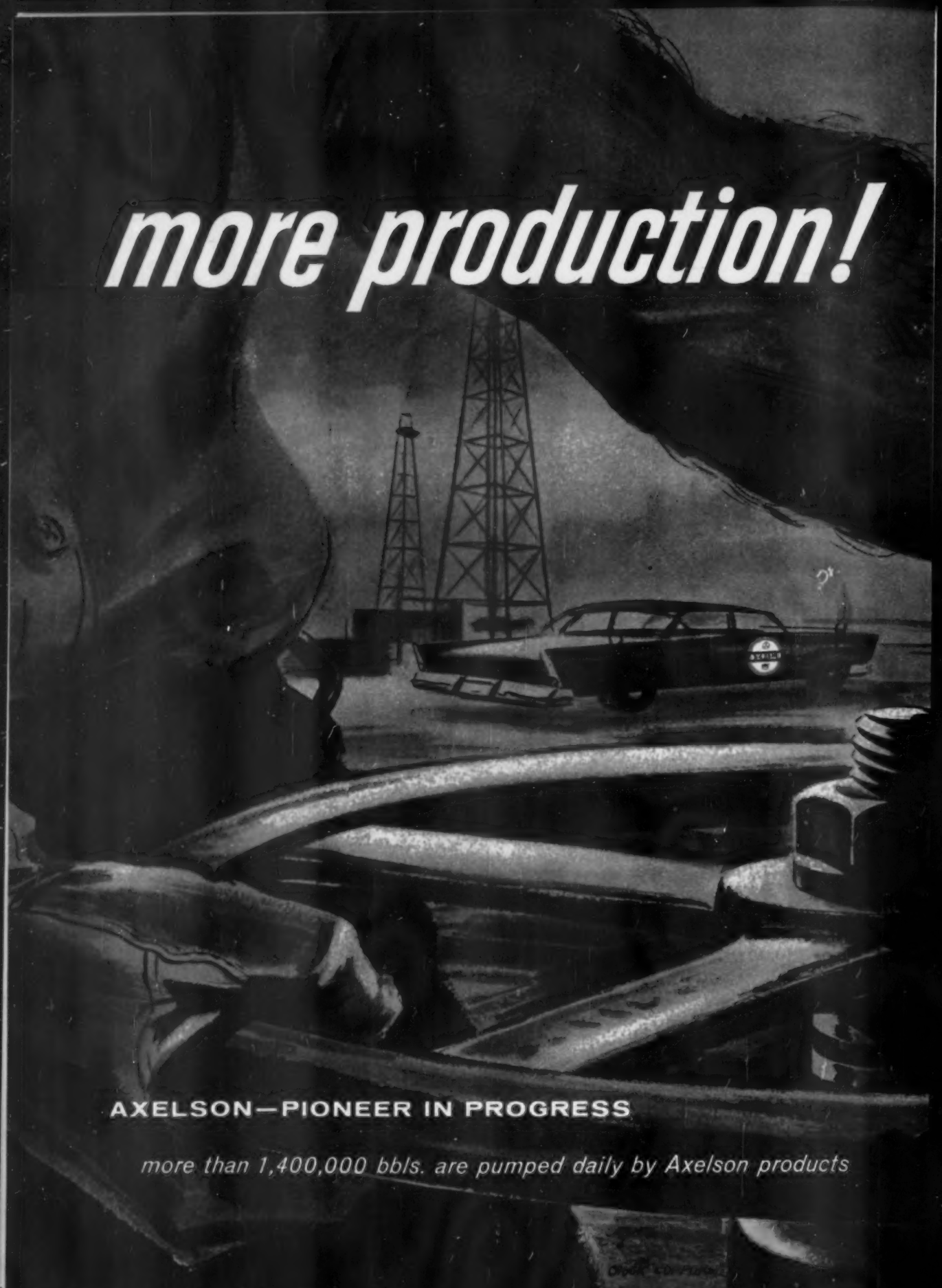

more production!
AXELSON—PIONEER IN PROGRESS
more than 1,400,000 bbls. are pumped daily by Axelson products

22%-60% MORE *with*

AXELSON VOLUMAX

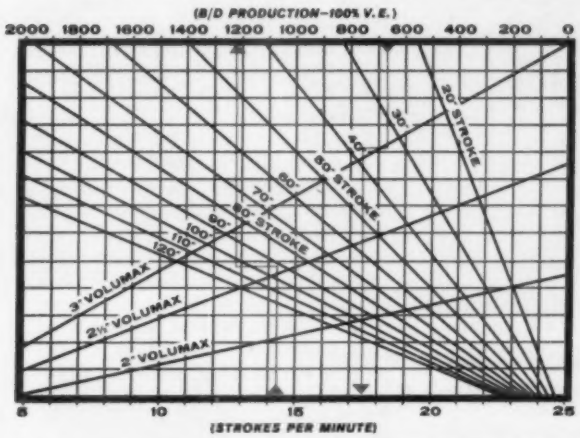
for example:

- In 2" tubing, 2" Volumax (1½" bore) outproduces insert pumps by 66% – tubing pump by 22%.
- In 2½" tubing, 2½" Volumax (2" bore) outproduces insert pumps by 63% – tubing pump by 29%.
- In 3" tubing, 3" Volumax (2½" bore) outproduces an insert pump by 53% – tubing pump by 27%.

PERFORMANCE FACTS

- An insert-type pump, the Volumax allows entire subsurface pumping equipment to be pulled with rods.
- Volumax achieves more production than tubing pump without changing stroke length or cycles per minute.
- Produces equal volumes as tubing pump at reduced cycle rate, reduces dynamic stresses in rod string.
- Allows use of shorter stroke surface unit in shallow, high volume wells.

HERE'S HOW TO APPLY THE VOLUMAX



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a visit from New Delhi of members of a petroleum symposium sponsored by the UN Economic Commission for Asia and Far East. The group included officials of several foreign countries, and Asian leaders who have a voice in government oil policies in that part of the world.

The well is part of a development drilling program in Nahorkatiya and Moran fields in Upper Assam, where shut-in production is rated at 50,000 bbl. daily. Recently discovered gas reserves, if fully used, will permit gas output of more than 100 M.c.f.d. when crude production is under way.

Who's getting the drilling contracts

Natchez Drilling Co., Natchez, Miss., has a new shallow contract operation in the Richie area of Acadia Parish, South Louisiana. It is a 3,500-ft. test for E. C. Hockendel at 1 Rupert, in 21-7s-1w.

Rowan Drilling Co., Houston, is drilling for Texas Pacific Coal & Oil Co. at a wildcat location 4 miles east of St. Martinville, in St. Martin Parish, South Louisiana. Location, at 1 Revert St. John, in 44-10s-7e, is 2 miles south of Section 28 field and 4 miles from production at St. Martinville. Texas Pacific's permit is for a 13,500-ft. test.

J. C. Trahan Drilling Contractor, Inc., Shreveport, has two new Shoreline Exploration Co. contracts under way in South Louisiana. It also is starting a deep Lower Cretaceous wildcat for its own account in South Mississippi. One of the Louisiana jobs is a 12,000-ft. wildcat southeast of East Golden Meadows field in Lafourche Parish. The other is a 11,600-ft. development well in the North Turtle Bayou area, in Terrebonne Parish. The new Mississippi test is a joint operation with R. Merrill Harris about 1¼ miles west of North Yellow Creek field in Wayne County. It is aimed for the Hosston zone with a projected depth of 10,500 ft.

Comet Drilling Co., Lafayette, La., is joining **C. B. Webster Drilling Co.** in drilling for George R. Brown, of Houston, on the latter's wildcat block southwest of West Chenier Perdue field, in southern Cameron Parish, Coastal Louisiana. Webster is on Brown's 1 Rutherford-Comer Unit, in 30-14s-74w. Comet's rig goes to 1 Nunez Unit 1, in Section 29. Both are 13,000-ft. tests.

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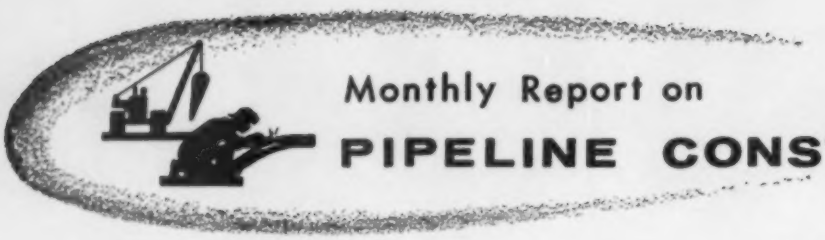

Monthly Report on PIPELINE CONSTRUCTION

PIPELINE ACTIVITY reported here is compiled from surveys by The Oil and Gas Journal among pipeline companies and construction contractors.

This summary report appears in the last issue of the Journal each month. New construction projects are reported weekly in Pipeline Briefs in the Journal's news section.

Projects are listed in three groups—U. S., Canadian, and Foreign—and according to type of line—crude, products, or natural gas.

U. S. Crude Oil Pipelines

• **Ashland Oil & Refining Co.,** Ashland, Ky.
Project: 42 miles of 6-in., 30 miles of 8-in., 2 miles of 10-in. from near Greensburg to Louisville, Ky.
Status: Under way.
Completion: March 1, 1959.

• **Cape Pipe Line Co.** (Sun Oil Co., Cities Service Co., Atlantic Refining Co.), Philadelphia.
Project: Line from lower Delaware Bay to Philadelphia.
Status: Planned.
Completion: 1960.

• **Gillette Pipeline, Inc.,** and **A. W. Hartwig, Inc.**
Project: A 102-mile line from Dead Horse Creek field to Casper, Wyo.
Status: Pending Wyoming Public Service Commission approval.

• **Great Northern Railway Co.**
Project: 400 to 600 miles of 12 to 20-in. from Williston basin in Mont. and N. D., to Clearbrook or St. Paul, Minn.
Contractor: **Pipe Line Technologists, Inc.,** Houston, has completed feasibility study.

• **Husky Oil Co.,** Cody, Wyo.
Project: Gathering lines to the refinery at Cody.
Status: Planned.

• **International Oil Pipeline Corp.,** New York City.
Project: Would own U. S. section of 1,500-mile, 30-in. line proposed by Mid-Continent Pipe Lines, Ltd., from Edmonton, Alta., to Chicago. (See Canadian Crude-Oil Pipelines).
Status: Pending Canadian Board of Transport Commission approval.

• **International Refineries, Inc.,** Minneapolis.
Project: Gathering lines in Newburg pool in Bottineau Co., N. D.
Status: Has applied to N. D. Public Service Commission for approval.

• **Mid-Continent Pipe Line Co.,** Tulsa.
Project: Lines in Okla.: 3 miles of 10-in. from Duncan to Velma; 6 miles of 8-in. from Cromwell to Tiger Creek Junction; 5 miles of 6-in. from Key West to Beggs, 12 miles of 8-in. from Drumright to Tulsa; 7 miles of 4-in. from Key West to Davenport.
Status: Planned.
Completion: 1959.

• **Northwestern Refining Co.,** St. Paul Park, Minn.
Project: Gathering lines in Newburg pool in Bottineau Co., N. D.
Status: Has applied to N. D. Public Service Commission for approval.

• **Service Pipe Line Co.,** Tulsa, Okla.
Project: 23 miles of 6, 8-in. from Fouke station to Magnolia station in Ark.
Status: Under way.
Contractor: **Snelling Co.,** Shreveport, La.
Completion: February 1, 1959.
Project: 9 miles of 10-in. from Snyder to Colorado City, Tex.
Status: Planned.
Completion: November 1959.

• **Shell Pipe Line Corp.,** Houston.
Project: 13 miles of 8-in., 11 miles of 12-in., 31 miles of 16-in. from Miss. Delta area to Norco, La.
Status: Under way.
Contractor: **Glaser Construction Co., Inc.,** Lafayette, La.; **J. Ray McDermot Co., Inc.,** Harvey, La.
Completion: March 1959.

• **Teton Pipeline Co.,** Denver.
Project: 8 miles of 5-in. to connect O'Brien field, Carbon Co., Wyo., with the Sinclair Pipe Line system.
Status: Planned.

U. S. Products Pipelines

• **Buckeye Pipe Line Co.,** N. Y. C.
Project: 70 miles of 8-in. from Wayne to Flint, Mich.
Status: Planned.
Completion: Mid-1959.

• **Humble Pipe Line Co.,** Houston.
Project: 11 miles of 4-in. from Irving terminal to Love field, Tex.
Status: Under way.
Completion: February 1959.

• **Husky Oil Co.,** Cody, Wyo.
Project: Line from Cody to the Yellowstone products line west from Billings, Mont.
Status: Planned.

• **Katy and New York Central Railroads.**
Project: 2,500 miles of 10-in. and smaller LPG line from Houston through Kansas City, St. Louis, Indianapolis, and Cleveland to Syracuse, then down to New York City. A branch would go through Chicago to Detroit.
Status: Proposed.
Contractor: **Williams Brothers Co.,** Tulsa, has completed feasibility study.
Completion: November 1, 1959.

• **Standard Oil Co. (Ind.),** Chicago.
Project: 24 miles of 8-in. from Lemont to Des Plaines, Ill.
Status: Under way.
Contractor: **Midwestern Contractors, Inc.,** Wheaton, Ill.
Completion: February 1959.

U. S. Natural Gas Pipelines

• **American Louisiana Pipe Line Co.,** Detroit.
Project: 28 miles of 12-in. Big Lake, La., gathering lines.
Status: Pending FPC approval.
Completion: March 1959.

• **Arkansas Industrial Pipeline Corp.** (Arkansas Louisiana Gas Co.), Shreveport, La.
Project: 130 miles of 18-in. from Perla to Helena, Ark.
Status: Planned.

• **Arkansas Louisiana Gas Co.,** Shreveport, La.
Project: A 300-mile line, plus gathering lines, from Tex.-La. coastal area to northern La., to connect with present system.
Status: Proposed.
Project: 100 miles of 16-in. from Clarksville to Perla, Ark.
Status: Planned.

• **Central Hudson Gas & Electric Corp.,** Poughkeepsie, N. Y.
Project: 13 miles of 10-in. from Highland to Kingston (Part II), N. Y.
Status: Planned.
Completion: 1960.

• **Coastal States Gas Producing Co.** and **Southern Coast Corp.,** Corpus Christi, Tex.
Project: 45 miles of 2 to 10-in. in Bee Co., Tex., to connect shut-in fields with Texas Eastern Transmission Corp.'s system.
Status: Planned.

• **Coastal Transmission Corp.,** Houston.
Project: 147 miles of 20-in. from Robstown to Bay City, Tex.; 68 miles of 22-in. from Bay City to Galveston Bay, Tex.; 252 miles of 24-in. from Galveston Bay to Baton Rouge, La.
Status: Under way.
Contractor: **Oklahoma Contracting Co.,** Dallas, has 130 miles of 24-in. from Baton Rouge to Lake Charles, La., Leamon Creech, supt., office at Port Barre, La., and 147 miles of 20-in. from Robstown to Bay City, Tex., Ed Peters, supt., office at Robstown. **Brown & Root, Inc.,** Houston, has 11 miles of 24-in. across Galveston Bay. **River Construction Co.,** Fort Worth, has 105 miles of 24-in. from Galveston Bay to north of Lake Charles, La., to complete May 1, 1959, T. M. Tatom, spread supt. **Buddy Sherrod, Inc.,** Conroe, Tex., has the Natchez River crossing between Beaumont and Port Arthur, Tex.
Completion: May 1, 1959.
Project: 320 miles of 3 to 14-in. gathering lines at various locations on Tex. and La. Gulf Coast.
Status: Approved.
Completion: April 1959.

• **Colorado Interstate Gas Co.,** Colorado Springs, Colo.
Project: 109 miles of 26-in. from Four-Way station in Tex. Panhandle, to Morton Junction in southeastern Colo.; 135 miles of 34-in. from there to Pueblo, and 100 miles of 30-in. on to Denver; 148 miles of 34-in. from CIG line at Rock Springs, Wyo., to Provo, Utah, to connect with proposed El Paso Natural Gas Co.'s line to Calif.
Status: Planned.
Completion: January 1, 1960.

• **Consumers Power Co.,** Jackson, Mich.
Project: 40 miles of 24-in. from Woodbury station to Laingsburg Junction, Mich.
Status: Planned.
Completion: July 15, 1959.
Project: 120 miles of 26-in. from Mich.-

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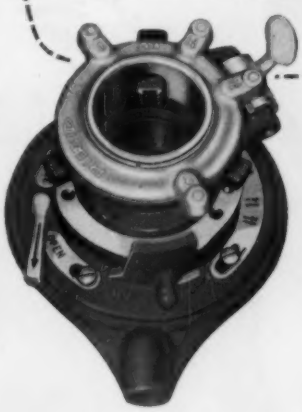

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PIPELINE CONSTRUCTION

Ind. border connection with Trunkline Gas Co., to Plymouth, Mich., and 20 miles of 24-in. from Northville to Clarkston, Mich.
Status: Planned.
Completion: September 1, 1959.

• **El Paso Natural Gas Co.**, El Paso, Tex.
Project: 51 miles of 20-in. from Terrell to Puckett, Tex., and 34 miles of 20-in. from Puckett tie-in to Goldsmith, Tex.
Status: Planned.
Project: 119 miles of 30-in. Permian-San Juan Line loops.
Status: Planned.
Completion: November 1959.
Project: 87 miles of gathering lines in Bisti field in San Juan Co., N. M.
Status: Has temporary FPC approval.
Project: 400 miles of 34-in. from Salt Lake City, to Calif. border near Las Vegas, Nev.
Completion: January 1960.

• **Gulf Interstate Gas Co.**, Houston.
Project: 10 miles of 12-in. supply loop to Erath field, Vermilion Parish, La., and 9 miles of various-size field lines in Acadia and Vermilion parishes, La..
Status: Approved.
Project: 10 miles of 20-in. loop in Jefferson Davis and Vermilion parishes, La., and 3 miles of 6-in. loop in Cameron Parish, La.
Status: Has temporary FPC approval.

• **Gulf Resources, Inc., Dallas.**
Project: 125-mile line from Lopeno field in Zapata Co. to a point in LaSalle Co., Tex.
Status: Proposed.

• **Houston Texas Gas & Oil Corp.**, St. Petersburg, Fla.
Project: 679 miles of 24-in. from Baton Rouge, La., to Kissimmee, Fla.; 138 miles of 18-in. and 97 miles of 20-in. from Kissimmee to Cutler, Fla.; 702 miles of 3 through 18-in. sales laterals in Fla. Main line will join Coastal Transmission's line from McAllen, Tex., to Baton Rouge, La.
Status: Under way.
Contractor: **Midwestern-Walco Contractors,** St. Petersburg, Fla., has the 24-in. with spread offices at Denham Springs, La., Lacedale, Miss., and Vernon, Fla. **Harbert Construction Corp.**, Birmingham, has remainder, of which 150 miles of 3 to 16-in. Fla. laterals have been subcontracted to **Mid-States Construction Corp.**, Mt. Vernon, Ill.
Completion: June 1959.

• **Humble Oil & Refining Co.**, Houston.
Project: 250 miles of 26 or 30-in. from Sw. Tex. to Houston.
Status: Planned.
Completion: 1960.

• **Iron Ranges Natural Gas Co.**, St. Paul.
Project: 70 miles of 6 to 16-in. in Mesabi Iron Range area.
Status: Pending FPC approval.
Completion: 1959.
Project: 63 miles of 12-in. between Duluth and Silver Bay, Minn.
Status: Pending FPC approval.
Completion: 1959.

• **Michigan Consolidated Gas Co.**, Detroit.
Project: 67 miles of 10, 12-in. between Sears and Traverse City, Mich.
Status: Under way.
Contractor: **Somerville Construction,** Ada, Mich., Floyd Huduall, supt., office at Cadillac, Mich.
Project: 60 miles of 10, 12-in. between Muskegon and Ludington, Mich.
Status: Under way.
Contractor: **Somerville Construction Co.,** Ada, Mich., jointly with **H. L. Gentry Construction Co.,** Jackson, Mich., Frank Morris, supt., office at Hart, Mich.

• **Michigan Wisconsin Pipe Line Co.**, Detroit.
Project: 373 miles of 24-in. main line loop; 21 miles of 16-in. loop in Wis.
Status: Pending FPC approval.
Completion: July 1, 1959.

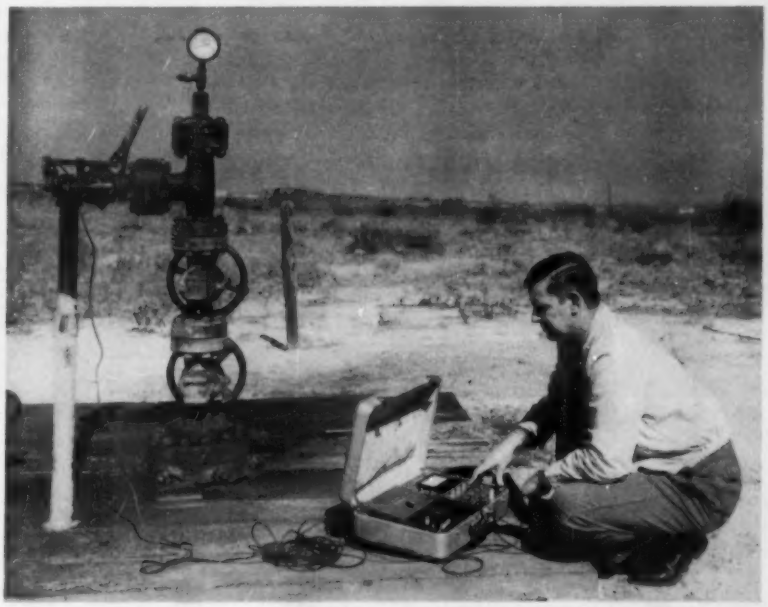
• **Midwestern Gas Transmission Co.**, Houston.
Project: 350 miles of 30-in. from Portland, Tenn., to Joliet, Ill.
Status: Pending FPC approval.
Completion: Planned for 1959.

• **Mississippi River Transmission Corp.** (Mississippi River Fuel Corp.), St. Louis.
Project: 115 miles of 24-in. from near Oran in southeast Mo., north between Ste. Genevieve and Bonne Terre into vicinity of Herculaneum and Pevely then into St. Louis Co.
Status: Planned.
Completion: Last half 1960.

• **Mountain Fuel Supply Co.**, Rock Springs, Wyo.
Project: 5 miles of 8-in. and 1 mile of 6-in. south of Rock Springs, Wyo.
Status: Planned.
Completion: July 1959.

• **Niagara Mohawk Power Corp.**, Syracuse, N. Y.
Project: 100 miles of 12-in. from Watertown to Massena, N. Y.
Status: Planned.
Contractor: **Fulghum Contracting Corp.,** Harrisburg, Pa.
Completion: August 1, 1959.
Project: 26 miles of 12-in. from Volney to Ellisburg, N. Y.
Status: Under way.
Contractor: **Consolidated Gas & Service Co.,** Chicago.
Completion: May 1, 1959.

• **North Carolina Natural Gas Corp.**, Fayetteville, N. C.
Project: 730 miles of 2 to 16-in. from near Mooresville, eastwardly across N. C.



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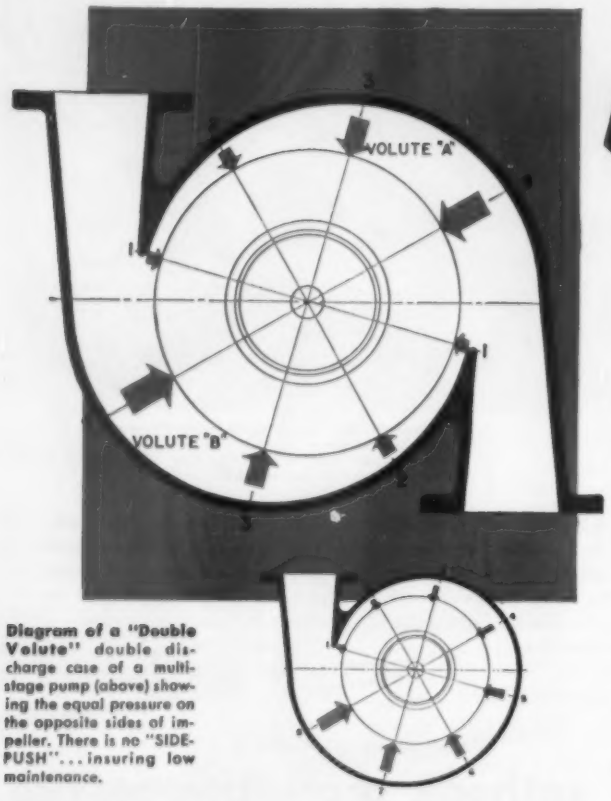
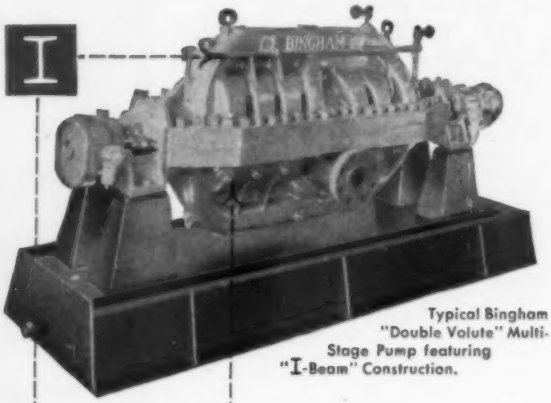


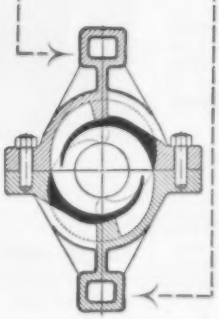
Diagram of a "Double Volute" double discharge case of a multi-stage pump (above) showing the equal pressure on the opposite sides of impeller. There is no "SIDE-PUSH"... insuring low maintenance.

Diagram of "Single Volute" pump case (immediately above) showing unequal pressures at opposite points around the periphery of the impeller. These unequal pressures cause "SIDE-PUSH" on the rotating elements, causing wear of rotating parts and, frequently, high maintenance.

2 ASSURED CASE STRENGTH FOR HIGH-PRESSURE SERVICE



Typical Bingham "Double Volute" Multi-Stage Pump featuring "I-Beam" Construction.



A transverse cross-section of Bingham "Double Volute" Multi-Stage Pumps, showing identical cross-overs cast integrally with the upper and lower halves of the pump casing.

Integral cross-overs in Bingham "Double Volute" multi-stage pumps produce casings of maximum strength for high pressure service because each cross-over is cast integrally with its half of the pump casing, and thereby becomes a structural member of Bingham's "I-Beam Truss Construction".

This feature, found only in Bingham pumps, increases the strength of the pump casing to such an extent that it can safely withstand operating pressures up to 2000 psi with standard construction (higher pressures with special construction).

Bingham "Double Volute" Multi-Stage Pumps will best serve your pipeline operations, as they are now serving major pipelines. Write to your nearest Bingham office for "Double Volute" Bulletin or additional information.

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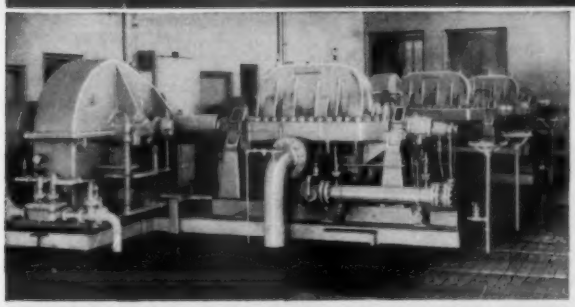
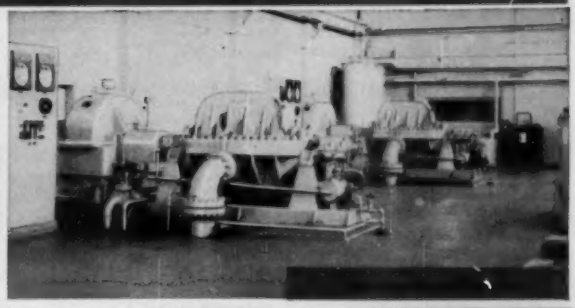
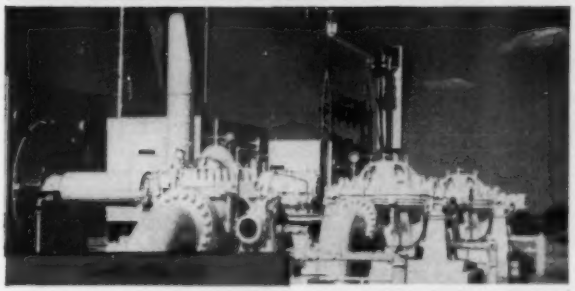
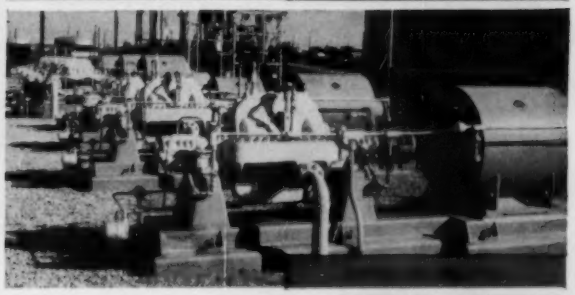
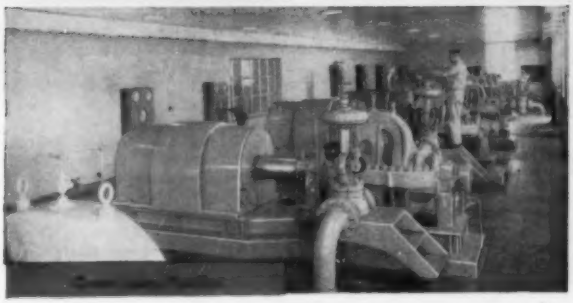
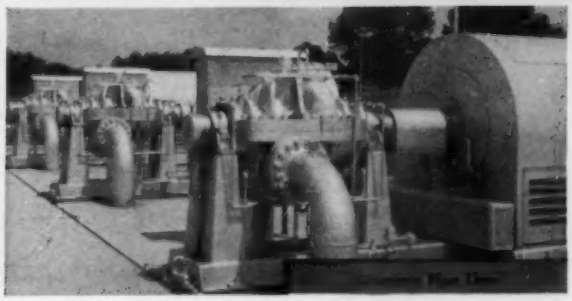

PARTIAL LIST OF MAJOR PIPELINES WITH BINGHAM "DOUBLE VOLUTE" PUMPS IN OPERATION OR ON ORDER

Ashland Oil Pipe Line
Buckeye Pipeline
Badger Pipeline
Cities Service Pipeline
Continental Pipeline
Esso Standard Oil Pipeline
Getty Oil Company
El Paso Natural Gas Prod. Co.
Everglades Pipe Line Co.
Great Lakes Pipeline
Interprovincial Pipeline
Interstate Pipeline
Lakehead Pipeline
Magnolia Pipeline
Minnesota Pipeline
Ohio Oil Company
Okla.-Miss. River Pipeline
Pasotex Pipeline
Pembina Pipeline
Phillips Pipeline
Plantation Pipeline
Rocky Mountain Pipeline
Salt Lake Pipeline
Shamrock Oil Company
Service Pipeline
Shell Pipeline
Sinclair Pipeline
Sohio Pipeline
Southern Pacific Pipeline
Standard Oil of Ind. Pipeline
Sun Pipeline
Texas Company
Tidewater Assoc. Pipeline
Trans-Mountain Pipeline
Trans-Northern Pipeline
Tuscarora Pipe Line
Union Oil Pipeline
Westpur Pipeline Company

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PHILADELPHIA, PA.
PITTSBURGH, PA.
SAN FRANCISCO, CALIF.
SEATTLE, WASH.
ST. LOUIS, MO.
ST. PAUL, MINN.
TULSA, OKLA.
TORONTO, ONT., CAN.
VANCOUVER, B. C., CAN.

PIPELINE CONSTRUCTION

Status: Under way.

Contractor: **Somerville Construction Co.**, Ada, Mich., has 100 miles of 10, 12-in. from Lumberton to Goldsboro, N. C., to complete March 1, 1959, Mike Larsen and Charles Copelard, supts., office at Fayetteville.

Completion: April 1, 1959.

• **Northern Illinois Gas Co.**

Project: 140 miles of 24-in. from Des Plaines to East Dubuque, Ill.

Status: Pending FPC approval.

Contractor: **Williams Brothers Co.**, Tulsa, has completed engineering and right-of-way studies.

• **Northern Natural Gas Co.**, Omaha, Neb.

Project: 18 miles of 20-in. from Dubuque, Iowa, to Menominee, Ill.

Status: Pending FPC approval.

Project 19 miles of 30-in. from Oakland to Ogden, Iowa.

Status: Pending FPC approval.

Project: 9 miles of 30-in. from Palmyra to Beatrice, Neb.

Status: Pending FPC approval.

Project: 11 miles of 30-in. from Clifton to Tescott, Kans.

Status: Pending FPC approval.

Project: 8 miles of 30-in. from Tescott to Bushton, Kans.

Status: Pending FPC approval.

Project: 11 miles of 30-in. from Sunray, Tex., to Beaver, Okla.

Status: Pending FPC approval.

Project: 8 miles of 30-in. from Beaver, Okla., to Mullinville, Kans.

Status: Pending FPC approval.

Project: 169 miles of 20-in. from Farmington, Minn., to Superior, Wis.

Status: Pending FPC approval.

Project: 23 miles of 24-in. main line loop in Neb.

Status: Pending PFC approval.

Project: 44 miles of 16-in. in Duluth-Superior, Wis., area.

Status: Pending FPC approval.

Project: 57 miles of 30-in. main line loop in Iowa, Minn., Neb. and Kans.

Status: Pending FPC approval.

Project: 188 miles of 24-in. and 215 miles of 30-in. from Farmington, Minn., to International border.

• **Northern Utilities Co.**, Casper, Wyo.

Project: 35 miles of 16-in. in Fremont-Natrona counties, Wyo.; 8 miles of 12-in. near Casper, Wyo.; 6 miles of 8-in. from Sand Draw gas field to Beaver Creek field, Wyo.; 12 miles of 6-in. from Beaver Creek field to the system servicing the Riverton-Lander, Wyo., area.

Status: Planned.

• **Offshore Gathering Corp.**, Houston.

Project: 364 miles in Gulf of Mexico off La.: 60 miles of 24-in., 70 miles of 26-in., and 234 miles of 30-in. dual line.

Status: Pending FPC approval.

• **Pacific Gas & Electric Co.**, San Francisco.

Project: 131 miles of 34-in. looping of Topock-Milpitas main line.

Status: Planned. Pending FPC approval.

Completion: 49 miles in 1959; 82 miles in 1960.

Project: 42 miles of 3-in. from Pittsburgh to Irvington, Calif.

Status: Planned.

Completion: 11 miles in 1959; 31 miles in 1960.

• **Pacific Lighting Gas Supply Co.**, Los Angeles.

Project: 128 miles of 34-in. from Topock, Ariz., to Newberry, Calif.

Status: California Public Utilities Commission has granted certificate contingent upon FPC approval of Transwestern Pipeline Co.'s proposed project terminating at Topock, Ariz.

Completion: November 1, 1959.

• **Pennsylvania Gas Co.**, Warren, Pa.

Project: 23 miles of 10-in. in Erie Co., Pa., 15 miles of 8-in. in Warren and Chautauqua counties, Pa.; 30 miles of branch lines, and several small distribution lines.

Status: Approved.

• **Peoples Natural Gas Co.**, Pittsburgh.

Project: 30 miles of 20-in. from Bentleyville to Imperial, Pa.

Status: Planned.

Completion: September 1, 1959.

Project: 25 miles of 24-in. from Waynesburg, Pa., to W. Va. line near Garrison, Pa.

Status: Planned.

Completion: September 1, 1959.

Project: 14 miles of 12-in. from Johnstown to Seven Springs, Pa.

Status: Planned.

Completion: September 1, 1959.

• **Permian Basin Pipeline Co.**, Omaha, Neb.

Project: 61 miles of 16-in. and 11 miles of field lines in Winkler Co., Tex.

Status: Under way.

Contractor: **R. H. Fulton & Co.**, Lubbock, Tex.

• **Piedmont Gas Co.**, Hickory, N. C.

Project: 78 miles of 2 to 8-in. extension off Transcontinental in N. C., to serve Gaston, Lincoln, Catawba, Caldwell, and Burke counties.

Status: Approved.

• **Pioneer Natural Gas Co.**, Amarillo Tex.

Project: 21 miles of 12-in. from Sudan to Muleshoe, Tex.

Status: Pending FPC approval.

Completion: March 1, 1959.

Project: 12 miles of 10-in. from Muleshoe, Tex., northward.

Status: Pending FPC approval.

Completion: March 1, 1959.

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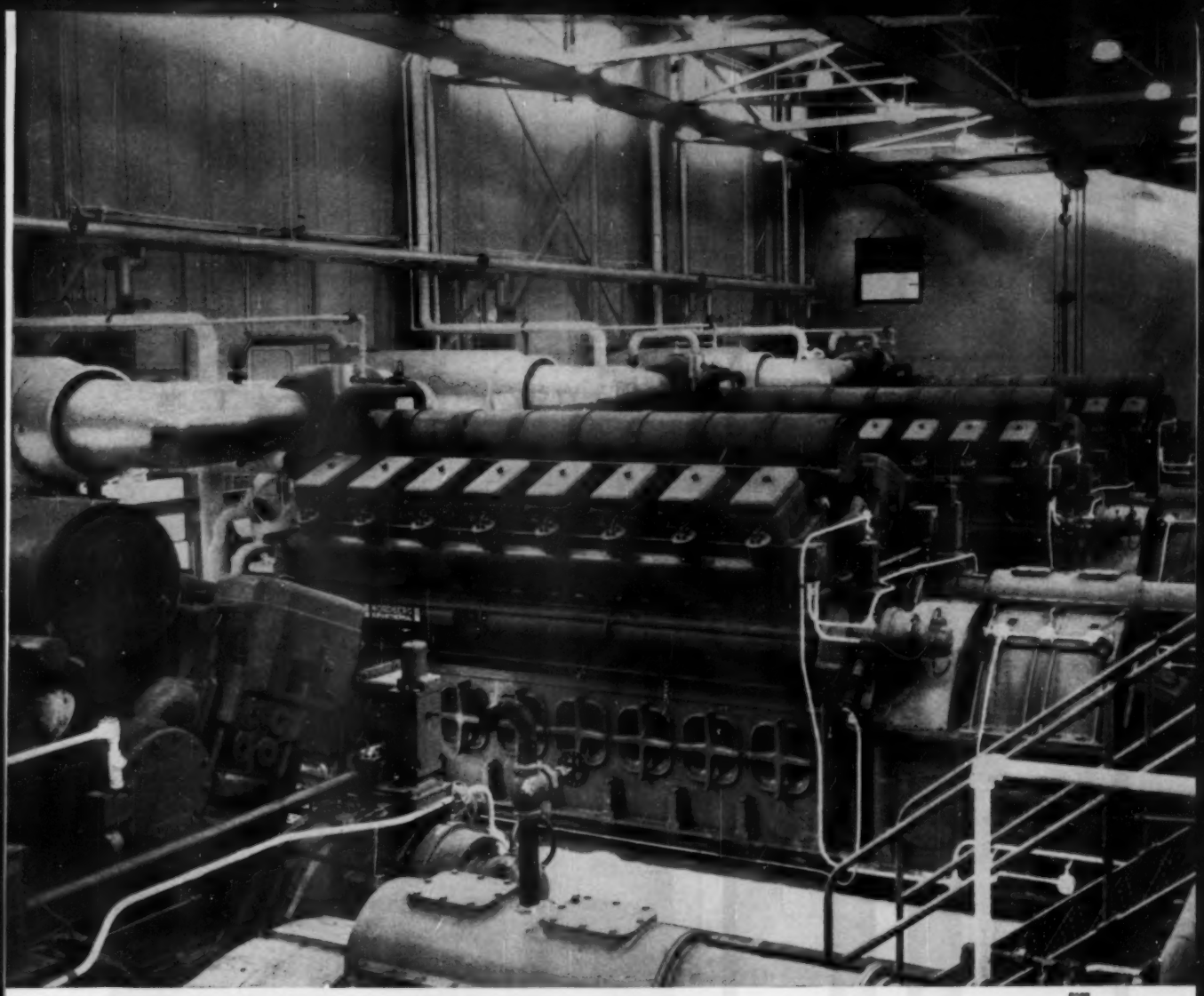

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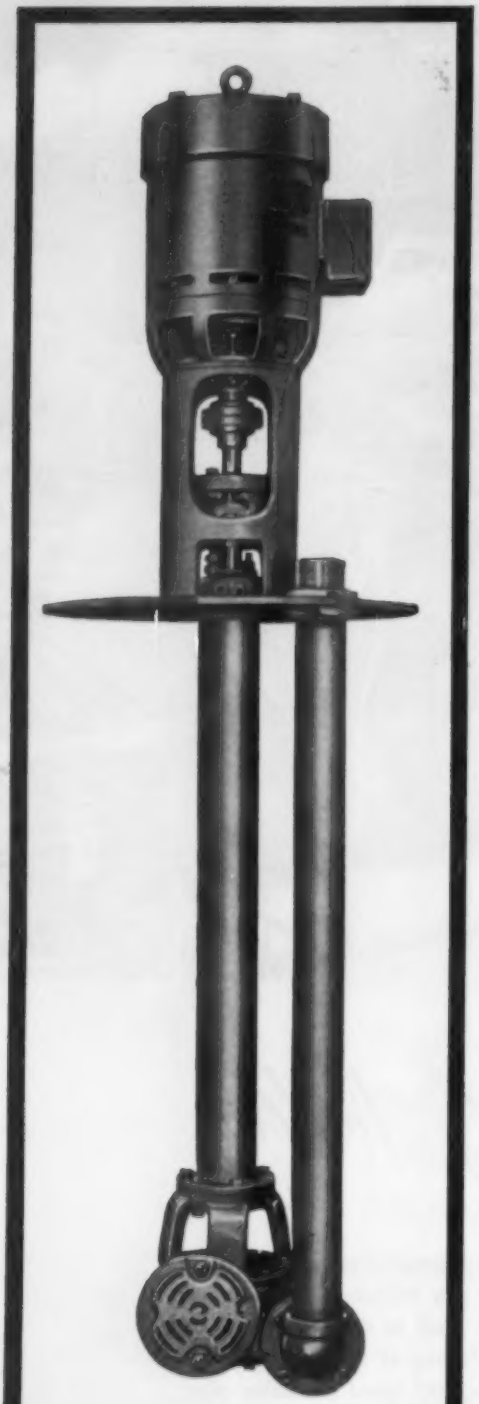

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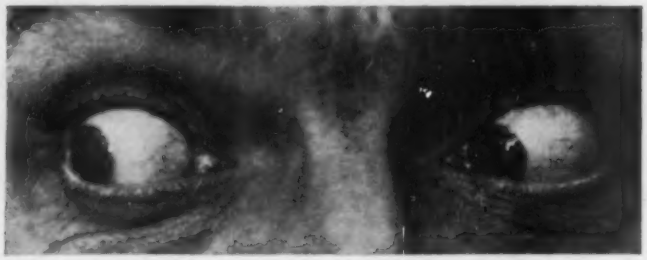

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PIPELINE CONSTRUCTION

• **Signal Oil & Gas Co.**, Los Angeles.

Project: Extension of gathering system from Tioga, N. D., to near the Canadian border in Burke Co.

Status: Being considered.

• **Southern California Gas Co.** and **Southern Counties Gas Co.**, Los Angeles.

Project: 206 miles of 34-in. from Ivanpah Lake to Placentia, Calif.

Status: Proposed.

Completion: December 1959.

• **Southern Natural Gas Co.**, Birmingham, Ala.

Project: Supply lines in S. La.: 9 miles of 16-in. Bayou Long field lateral, 7 miles of 16-in. Little Bayou Pigeon lateral, 4 miles of 6-in. Mystic Bayou field lateral, 2 miles of 6-in. East Bayou Pigeon lateral, 13 miles of 10-in. Tantine field lateral, 46 miles of 20-in. from White Castle to South Section 28 field, 7 miles of 10-in. Bayou Boullion field, 11 miles of 8-in. East Happytown field lateral, 17 miles of 10-in. Loisel field lateral, 16 miles of 20-in. Lake Washington field lateral, 25 miles of 12-in. West Delta Block 30 lateral, 4 miles of 8-in. Bayou Long field lateral, 6 miles of 4-in. Bayou Villars field lateral, 12 miles of 6-in. Marrero field lateral, 6 miles of 6-in. South Lake Long field lateral, 1 mile of 4-in. Tigers Ridge field lateral, 35 miles of 16-in. Barataria Line loop.

Status: Under way.

Contractor: **Western Pipeline, Inc.**, Austin, Tex., has 46 miles of 20-in., 14 miles of 16-in., 14 miles of 10-in., 23 miles of 8-in., and 7 miles of 6-in. **Brown & Root, Inc.**, Houston, has 16 miles of 20-in., 14 miles of 16-in., 25 miles of 12-in., 2 miles of 8-in., 12 miles of 6-in., and 6 miles of 4-in.

Project: 79 miles of 16-in. from Ocmulgee to Wrens, Ga.; 62 miles of 14-in. from Ocmulgee to Atlanta, Ga.

Status: Pending FPC approval.

Project: Facilities to attach additional supplies in S. La.: 2 miles of 8-in. Coffee Bay field lateral, 2 miles of 4-in. Bayou Postillion lateral.

Status: Pending FPC approval.

Completion: 1959.

Project: Facilities to attach additional supplies in Miss.: 8 miles of 8-in. Hub field lateral, 40 miles of 14-in. and 40 miles of 16-in. from Cranfield to Gwinville, 3 miles of 8-in. Dexter field lateral.

Status: Pending FPC approval.

Completion: 1959.

• **Southern Union Gas Co.** and **Southern Union Gathering Co.**, Dallas.

Project: 7 miles of 8-in., 4 miles of 10-in., 6 miles of 12-in. from Albuquerque, N. M., to Tijeras Canyon east of Albuquerque.

Status: Planned.

Completion: April 30, 1959.

Project: 11 miles of 8-in. from Atoka Penn field to Artesia Junction, N. M.

Status: Planned.

Completion: June 30, 1959.

• **South Georgia Natural Gas Co.**, Thomasville, Ga.

Project: Lines in Ga.: 2 miles of 2-in. near Meigs; 31 miles of 3-in. near Nashville; 41 miles of 4-in. and 39 miles of 6-in. near Tifton.

Status: Planned.

Completion: Summer 1959.

• **Tennessee Gas Transmission Co.**, Houston.

Project: 21 miles of 16-in. and 2 miles of 12-in. to offshore La. fields.

Status: Pending FPC approval.

Project: 158 miles of 36-in. loop in La. and Miss.

Status: Pending FPC approval.

Completion: Planned for 1959.

• **Tensas Gas Gathering Corp.**

Project: 37 miles of 2 to 8-in. from Rodney field, Miss., westerly to connect with Olin Gas Transmission Co.'s line in Tensas Parish, La.

Status: Approved.

• **Texas Eastern Transmission Corp.**, Shreveport, La.

Project: 22 miles of 14-in. from Opelousas station to Rayne Field, La.

Status: Under way.

Contractor: **Houston Contracting Co.**, Houston.

Completion: 1959.

Project: 13 miles of 30-in. from Grennup Co., Ky., to Scioto Co., Ohio; 16 miles of 30-in. from Noble Co. to Monroe Co., Ohio.

Status: Pending FPC approval.

Completion: 1959.

Project: 13 miles of 30-in. in Bucks Co., Pa.; 81 miles of 24-in. from Leidy Storage field to Perulack Station, Pa.; 66 miles of 30-in. from Delmont, Pa., to Lambertville, N. Y.; 23 miles of 20-in. from Station 25 to Chester Junction, Pa.

Status: Pending FPC approval.

Completion: 1959.

Project: 40 miles of 36-in. from Station 26 to Station 27 in N. J., and 4 miles of 30-in. from Station 27, N. J., to Staten Island, N. Y.

Status: Pending FPC approval.

Completion: 1959.

• **Texas Gas Transmission Corp.**, Owensboro, Ky.

Project: 30-in. looping program: 50 miles near Alexandria, La.; 24 miles near Bastrop, La.; 9 miles near Greenville, Miss., 9 miles near Clarksdale, Miss.

Status: Approved. Under way.

Completion: 1959.

Contractor: **Houston Contracting Co.**, Houston, has completed 30 miles in vicinity of Pineville and Bastrop, La.

Project: 26-in. looping program: 9 miles

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PIPELINE CONSTRUCTION

near Hardinsburg, Ky.; 10 miles near Louisville, Ky.
Status: Approved.
Completion: 1959.
Project: 8 miles of 10-in. near Petersburg, Ind.; 5 miles of 16-in. near Dixie, Ky.; 2 miles of 6-in. near Linton, Ind.; 1 mile of 6-in. near Lawrenceville, Ill.
Status: Approved.
Completion: 1959.

- **Texas Illinois Natural Gas Pipeline Co.,** Chicago.

Project: 860 miles of 30-in. looping of present system.
Status: Planned.
Completion: 1960-1961.

- **Transcontinental Gas Pipe Line Corp.,** Houston.

Project: 57 miles of 30-in. main line loop in various states; 51 miles of 36-in. main line loop in various states; 219 miles of 36-in. main line loop in various states; 17 miles of 20-in. lateral; 52 miles of 10, 14-in. laterals in Tex. and La.; 51 miles of 24-in. and under in Tex. and La.
Status: 51 miles of 36-in. is approved and under way; 57 miles of 30-in. is deferred and planned; remainder is planned, pending FPC approval.
Contractor: **Sharman, Allen, Gay & Taylor, Inc.,** Houston; **H. C. Price Co.,** Bartlesville, Okla.; **Hallmac Construction Co.,** Houston; **Bechtel Corp.,** San Francisco; **J. P. Neill & Co., Inc.,** Dallas; **Panama-Williams Corp.,** Houston; **Brown & Root, Inc.,** Houston.
Completion: 1959.

- **Transwestern Pipe Line Co.** (Warren Petroleum, Monterey Oil Co., J. R. Butler), Dallas.

Project: 635 miles of 24-in. from Perryton and Fort Stockton, Tex., to Roswell, N. M., and 670 miles of 30-in. from Roswell to Topock, Ariz.
Status: Pending FPC approval.
Completion: Mid-1959.

- **Trunkline Gas Co.,** Houston.

Project: 45 miles of 24-in. from Moss Hill to Silsbee, Tex.
Status: Planned. Pending FPC approval.
Completion: May 1959.
Project: 115 miles of 30-in. from Pitkin to Riverton, La.
Status: Planned. Pending FPC approval.
Completion: July 1959.
Project: 119 miles of 30-in. from Kilborne, La., to Ballentine, Miss.
Status: Planned. Pending FPC approval.
Completion: September 1959.
Project: 117 miles of 30-in. from Canadaville, Tenn., to Bardwell, Ky.
Status: Planned. Pending FPC approval.
Completion: August 1959.
Project: 113 miles of 30-in. from Marion to Neoga, Ill.
Status: Planned. Pending FPC approval.
Completion: September 1959.
Project: 204 miles of 26-in. from Bourbon, Ill., to Vistula, Ind.
Status: Planned. Pending FPC approval.
Completion: August 1959.
Project: 45 miles of 14-in. and 32 miles of 4 to 10-in. from Hitchcock to Katy, Tex.
Status: Planned. Pending FPC approval.
Completion: June 1959.
Project: 33 miles of 20-in., 32 miles of 16-in., 9 miles of 6-in. from Lowry, La., to Block 26.
Status: Planned. Pending FPC approval.
Completion: May 1959.
Project: 34 miles of 12-in. from Lowry, La., to Block 67.
Status: Planned. Pending FPC approval.
Completion: July 1959.

- **United Gas Pipe Line Co.,** Shreveport.

Project: 43 miles of 30-in. from Lake Pontchartrain to Kiln, Miss.
Status: Under way.
Contractor: **Hallmac Construction Co.,** Houston.
Completion: March 24, 1959.
Project: 37 miles of 30-in. from Gulfport Tap to Moss Point, Miss.
Status: Under way.
Contractor: **Williams Brothers Co.,** Tulsa, Okla.
Completion: February 17, 1959.

- **Valley Gas Transmission, Inc.** (Fish Engineering Corp.), Houston.

Project: 150 to 160 miles of 3 to 6-in. gathering lines to tap fields in Starr, Hidalgo, Brooks, and Jim Wells counties, Tex.
Status: Under way.
Completion: First 100 miles completed; remainder by summer 1959.

- **Western Slope Gas Co.** (Public Service Co. of Colorado), Denver.

Project: 2 miles of 8-in., 18 miles of 6-in., 13 miles of 4-in. extension of gathering facilities in Colorado.
Status: Planned.
Completion: 1959.

Canadian Crude Oil Pipelines

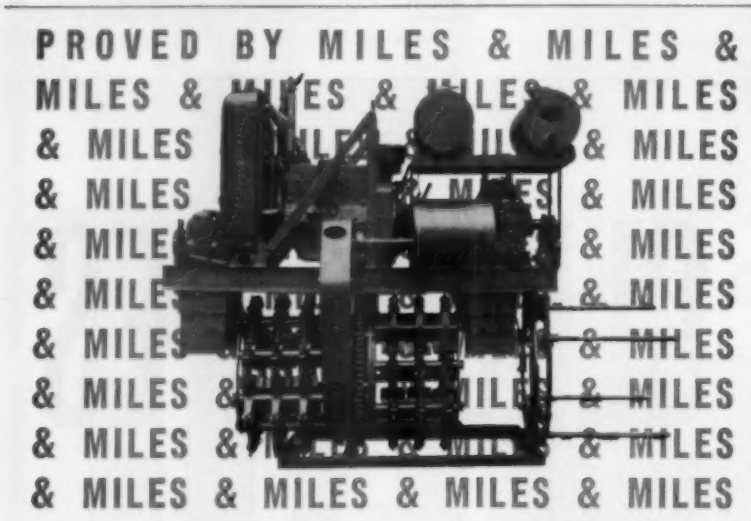
- **Act Oils, Ltd.**

Project: A 450-mile line from the Peace River region of northern B. C. to tidewater at Kitimat, B. C.
Status: Pending British Columbia Government approval.

- **B-A Alberta Pipe Line, Ltd.,** Calgary, Alta.

Project: 35 miles of 8-in. to connect Drumheller field, Alta., with existing lines running to Edmonton.
Status: Pending approval.

- **Bituminous Oil Pipeline Co.** (Royalite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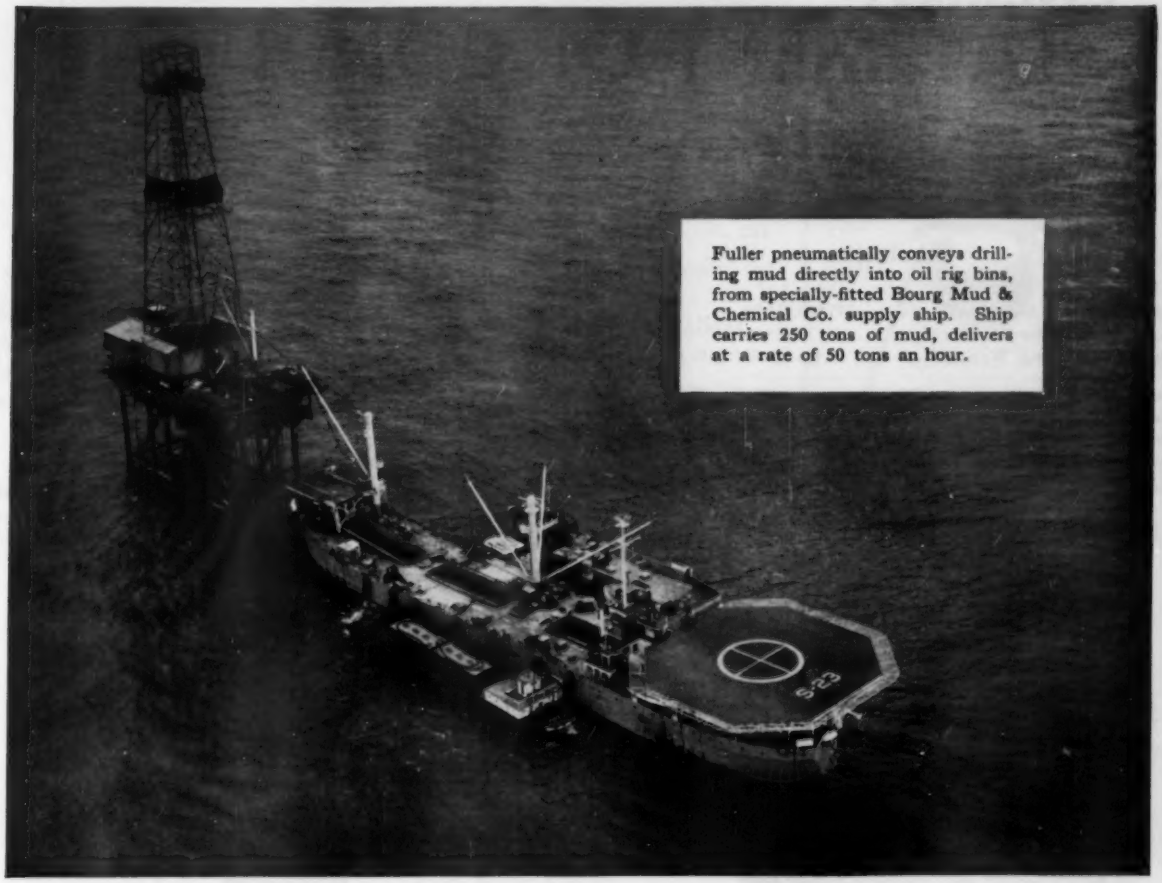
The Arithmetic of Materials Handling



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STATEMENT OF CONDITION

December 31, 1958

RESOURCES		
Cash and Due from Banks	$95,688,651.06	
U. S. Government Securities	82,730,728.00	
Other Bonds and Warrants	13,463,334.70	$191,882,713.76
Loans and Discounts		88,904,674.21
Repurchase Agreements—U. S. Gov't. Securities		9,457,750.00
Income Receivable Accrued		603,399.62
Stock in Federal Reserve Bank		390,000.00
Bank Premises		4,000,000.00
Customers' Liability Under Letters of Credit		353,000.00
		$295,591,537.59

LIABILITIES		
Deposits		$273,813,952.29
Letters of Credit Outstanding		353,000.00
Income Collected, Not Earned		425,695.13
Reserve for Taxes, Interest, Etc.		1,513,339.21
Capital—Common	$ 5,250,000.00	
Surplus	7,750,000.00	
Undivided Profits & Reserves	6,485,550.96	19,485,550.96
		$295,591,537.59

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PIPELINE CONSTRUCTION

Oil Co., and Can-Amera Oilsands Development, Ltd.)

Project: A 250-mile line from Athabasca oil sands in northeastern Alta., to Edmonton.

Status: Proposed.

Completion: 1960.

- **Independent Pipe Line Co.** (Home Oil Co.), Calgary.

Project: 1,073 miles of 36-in. from Edmonton, Alta., to Superior, Wis.; 946 miles of 34-in. from Superior to Montreal, Que.; 72 miles of 16-in. and 74 miles of 10-in. feeder lines from Calgary to Bellshill Lake, Alta., on the 36-in. line.

Status: Proposed.

- **Mid-Continent Pipe Lines, Ltd.,** Edmonton, Alta.

Project: 1,500 miles of 30-in. from Edmonton to Chicago, via Sask., N. D., Minn., Wis., and Ill. U. S. section to be owned by International Oil Pipeline Corp., New York City.

Status: Pending Canadian Board of Transport Commission approval. **W. C. Gilman & Co.,** New York City, has made preliminary study.

- **Peace River Oil Pipe Line Co., Ltd.,** Calgary, Alta.

Project: 8 miles of 6-in., 45 miles of 8-in., and 17 miles of 12-in. from its Fox Creek Pump Station to Windfall, Virginia Hills, and Swan Hills fields in Alta.

Status: Approved.

Canadian Products Pipelines

- **Foothills Products Pipe Line, Ltd.** (Pembina Pipe Line Co., Mannix Co., Ltd.), Calgary, Alta.

Project: Gathering system to connect Alta. gasoline plants to trunk line from Alta. to Pacific Coast.

Status: Proposed.

- **Hydrocarbons Pipeline Co.,** Winnipeg, Man.

Project: 800 miles of 6, 8-in. LPG line from near Edmonton to Fort William, Ont.

Status: Has Parliament of Canada approval. Seeking approval of Federal Board of Transport Commissioners and the Alberta Petroleum and Natural Gas Conservation Board.

Contractor: **Dutton - Williams Brothers, Ltd.,** Calgary, and **A. D. Little Co.,** Boston, are consultants.

- **Pembina Pipe Line, Ltd.,** Edmonton, Alta.

Project: A 1,200-mile line to carry sulfur, LPG, and natural gasoline from Alta.'s gas fields to eastern Canada.

Status: Proposed.

Canadian Natural Gas Pipelines

- **Alberta & Southern Gas Co., Ltd.** (Pacific Gas & Electric Co.), Los Angeles, and **Westcoast Transmission Co., Ltd.,** Calgary.

Project: A 36-in. line from Alta. border through Crowsnest Pass to the B. C.-Idaho border at Kingsgate, B. C.

Status: Pending approval of Alberta Oil and Gas Conservation Board.

- **Alberta Gas Trunk Line Co., Ltd.,** Calgary.

Project: 122 miles of 30-in. from Princess to Torrington, Alta.; 122 miles of 6 to 16-in. at various locations.

Status: Planned.

Completion: October 1959.

- **Cartier Gas Corp.** (St. Maurice Gas, Inc., and Consumers' Gas Co., Toronto).

Project: 170 miles from Montreal to Quebec City.

Status: Proposed.

- **Northern Natural Gas Co.,** Omaha.

Project: 73 miles of 20-in. from Savanna Creek to Pincher Creek, Alta.

Status: Planned.

Project: 32 miles of 24-in. from Pincher Creek to Mont. border to tie in with planned U. S. line on to Minneapolis.

Status: Planned.

- **Saskatchewan Power Corp.,** Regina, Sask.

Project: 267 miles of distribution lines.

Status: Planned.

Completion: 1959.

- **Van Tor Oil & Exploration Co.,** Vancouver, B. C.

Project: Line from B. C. mainland to Vancouver Island.

Status: Proposed.

Completion: 1960.

- **Westcoast Transmission Co., Ltd.,** Calgary.

Project: (See Alberta & Southern Gas Co., Ltd. for joint project).

Foreign Crude Oil Pipelines

- **Arabian American Oil Co.,** Dhahran, Saudi Arabia and N.Y.C.

Project: 63 miles of 30, 32-in. from Khursaniyah to Ras Tanura.

Status: Planned.

Contractor: Company personnel.

Completion: January 1, 1960.

Project: 18 miles of 34, 36-in. from Qatif to Ras Tanura.

Status: Planned.

Contractor: Company personnel.

Completion: July 1, 1962.

Project: 6 miles of 30-in. from Ras Tanura to Ras Tanura terminal; 4 miles of 14-in. from Buqqa to QA-2 pipeline.

Status: Planned.

Contractor: Company personnel.

Completion: October 1, 1960.

- **Assam Oil Co.,** Digboi, Lakhimpur District, Assam, India.

Project: 600 miles of 20-in. from Nahorkatiya field in Upper Assam to Barauni, India, to connect with Burmah Oil Co.'s proposed 250-mile line from Barauni to Calcutta.

Status: Survey of possible routes under way.

Contractor: **Pipe Line Engineering Co.,** Dallas, is making survey.

- **Bolivia-Paraguay.**

Project: 500 miles of 6-in. from Southeast Bolivia to a proposed refinery on Paraguay River, and later to Asuncion.

Status: Planned.

- **British Petroleum, Ltd.**

Project: 60 miles of 18-in. across South Wales, from Milford Haven to the Llandarcy refinery.

Status: Under way.

Completion: Late 1959.

- **Burmah Oil Co., Ltd.,** Glasgow, Scotland.

Project: 250 miles of 20-in. from Barauni to Calcutta, India, extending Assam Oil Co.'s proposed line.

Status: Survey under way.

Contractor: **Collins Construction Co.,** Port Lavaca, Tex., is surveying locations for about 40 river crossings.

- **Cia. Shell de Venezuela.**

Project: 70 miles of 30, 34-in. heated line from Bachaquero to Puerto Miranda, and an unheated 31in. parallel to the section from Cabimas to Puerto Miranda.

Status: Under way.

Contractor: **Williams Brothers Sudamericana, Ltd.**

- **Colombian Petroleum Co.**

Project: 42 miles of 6-in from Tibu field to Rio de Oro in Colombia, S. A.

Status: Under way.

- **C.R.E.P.S., Societe Nationale de Recherche et d'Exploration des Petroles en Algerie (SN Repal)** and **Cie. Francaise des Petroles Algerie,** Paris, France.

Project: 470 miles of 24-in. from Edjele

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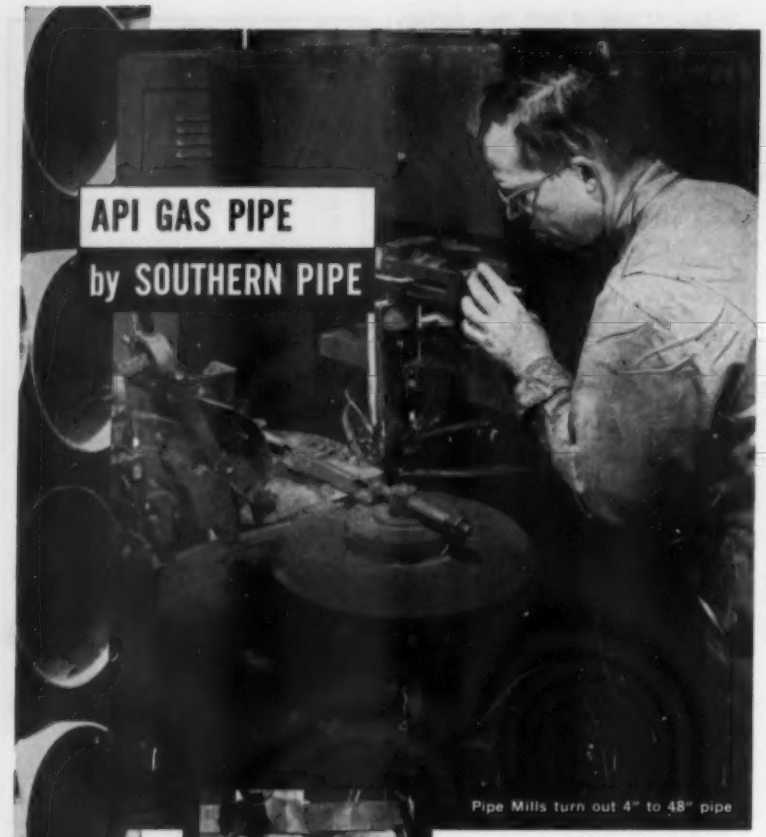

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PIPELINE CONSTRUCTION

fields in southeastern Algeria to the Tunisian Mediterranean coast.

Status: Preliminary work under way. Pipe laying to start in 1959.

Contractor: **TRAPSA** (transportation subsidiary of CREPS), with technical assistance and supervision of the project by **Bechtel Mediterranean** (subsidiary of Bechtel Corp., San Francisco).

Completion: September 1960.

- **Elburz Oil Corp.**

Project: 1,000 miles of 38-in. to move Qum crude to the Mediterranean.

Status: Planned.

- **Iranian Oil Participants, Ltd.**

Project: 30 miles of 20-in. and 22 miles of 16-in. looping of Agha Jari to Bandar Mashur line.

Status: Planned.

Project: 50 miles of 26, 28-in. from Gach Saran field to new terminal at Kharg Island in the Persian Gulf.

Status: Under way.

Contractor: A joint venture of **Raymond Concrete Pile Co.** and **Williams Bros. Co.**, Tulsa, **Richard Costain, Ltd.**, and **John Brown, Ltd.**, London, and **Werkspoor & Bredoro**, The Netherlands.

- **Iraq Petroleum Co.**, London.

Project: 600 miles of up to 40-in. from Kirkuk field through Iraq to Turkish port of Iskenderun on the Mediterranean.

Status: Proposed. Survey completed.

Project: 76 miles of 30-in. looping along the Kirkuk-Banias line.

Status: Under way.

Completion: Early 1959.

- **Kuwait Oil Co., Ltd.**, London.

Project: 61 miles of 30-in. from Raudhatain area to Ahmadi.

Status: Under way.

Completion: June 1959.

Project: 5 miles No. 11 and 5 miles No. 12 gravity line from Ahmadi North Tank Farm to North Pier; 4 miles of 34-in. from Ahmadi South to Ahmadi North Tank Farm; 6 miles of 38-in. loading lines on North Pier.

Status: Under way.

Completion: First quarter 1959.

- **Mene Grande Oil Co.**, Caracas, Venezuela.

Project: 24 miles of 16-in. from Zarza to Zulus; 12 miles of 24-in. from West Guara to Oficina; 5 miles of 24-in. near Melones.

Status: Planned.

Completion: 1959.

- **Middle East Pipeline.**

Project: 1,500 miles of 38, 40-in. from Persian Gulf to Mediterranean at Iskenderun, Turkey.

- **Petroleo Brasileiro S. A. (Brazil).**

Project: 40 miles of 12-in. from Catu to Madre de Deus in Bahia.

Status: Under way.

Contractor: **Techint, Inc.**

Project: 80 miles of 24-in. to tie in to proposed Caxias refinery near Rio de Janeiro.

Status: Planned.

- **Rotterdam-Rhine Pipeline Co.** (Caltex Petroleum Maatschappij, Bataafsche Petroleum Maatschappij, Gelsenberg Benzin A. G., and Moiloil A. G.)

Project: 59 miles of 30-in. and 96 miles of 24-in. from Rotterdam to Ruhr industrial area in West Germany to supply refineries at Godorf and Wesseling, and a 25-mile branch to Wessel to serve the refinery in Gelsenkuchen.

Status: Under way.

Contractor: **Bechtel International Co.** is managing the engineering and construction, W. C. Anthony, chief of construction operations, office at The Hague. German

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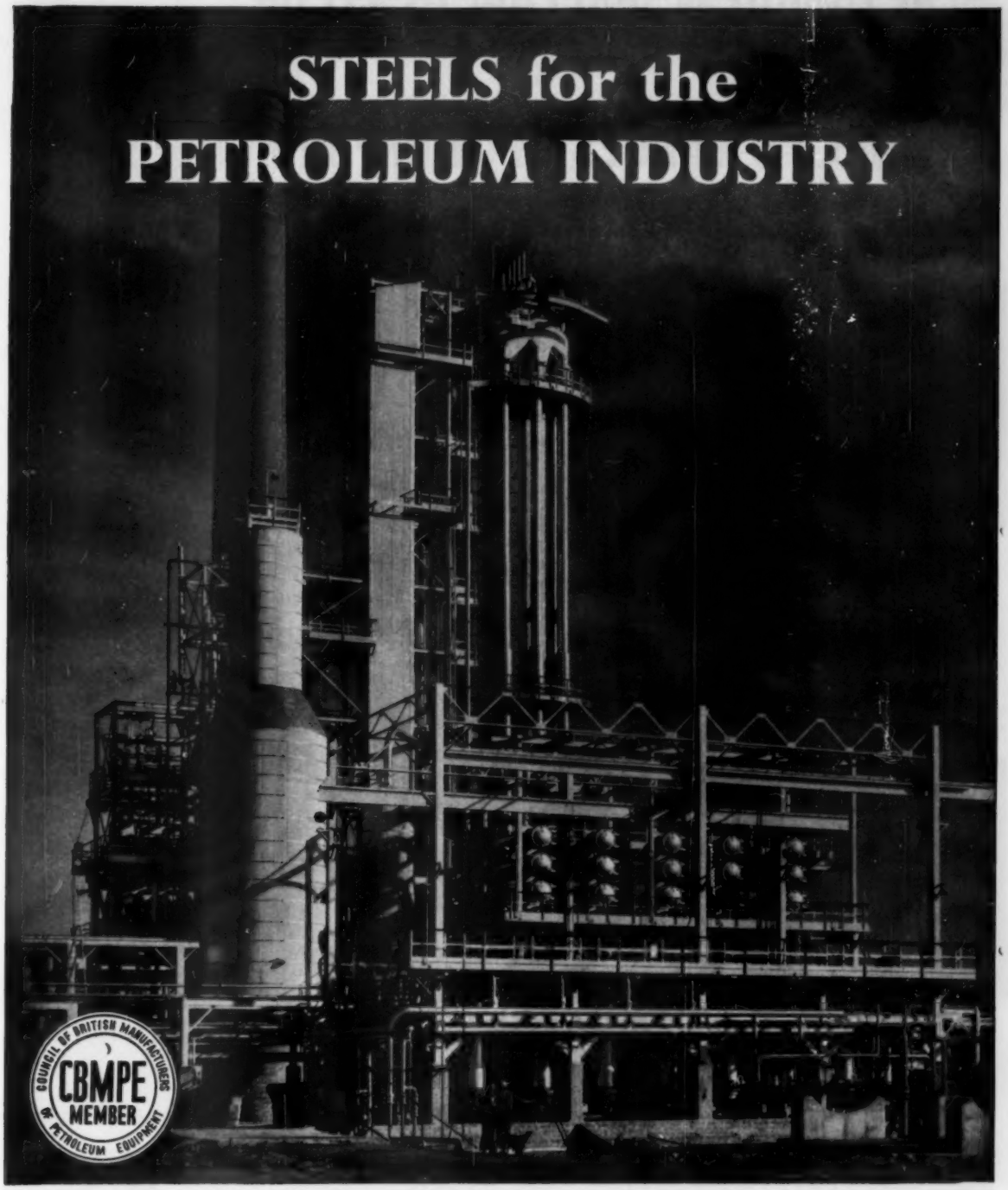

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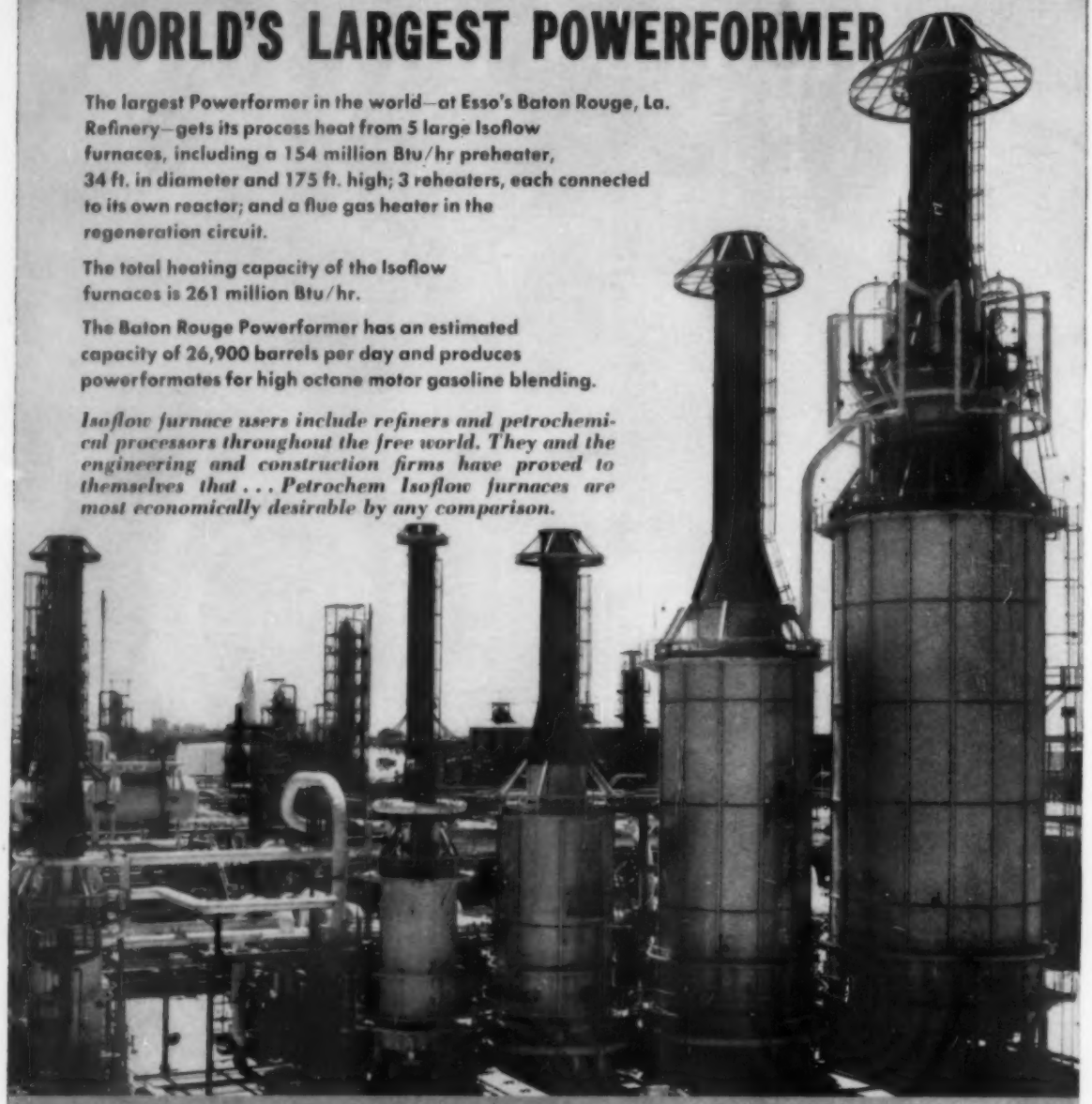

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PIPELINE CONSTRUCTION

and Dutch contractors have 33 miles of 24-in. in south Holland, and 4 major submarine crossings.

Completion: Mid-1960.

- **Royal Dutch-Shell.**

Project: 700-mile line across Europe from the Mediterranean to the North Sea, running through eastern France, Luxembourg, West Germany, Netherlands, and Belgium. Main line to be 30-in.

Status: Considering project as joint venture with several other companies.

- **SOPEG** (construction organization for Cie. Francaise des Petrole (Algerie) and Ste. Nationale de Recherche et d'Exploitation des Petroles en Algerie).

Project: 412 miles of 24-in. from Hassi Messaoud field in the Algerian Desert to Bougie on the Mediterranean Coast.

Status: Under way.

Contractor: **Entrepose Co.** and **Ste. Parisienne pour Industrie Electrique** have 281 miles. **SOCOMAN** and **Eau Assainissement** have 131 miles.

Completion: Late 1959.

- **South European Pipeline Co.** (Jersey Standard, Caltex, and 17 European firms).

Project: 932 miles of 30-in. from Marseilles, France, to Hamburg, Germany.

Status: Proposed.

- **Superior Oil Co.,** Los Angeles.

Project: A 16 and 24-in. line from its Lake Maracaibo, Venezuela, production to shore.

Status: Planned.

Contractor: **Pipe Line Technologists, C.A.,** Maracaibo, has design.

- **Union of Soviet Socialist Republic.**

Project: 2,315 miles of 28-in. Trans-Siberian crude-products line from Ufa Tuimaza fields in Bashkiria to Irkutsk near Lake Baikal.

Status: Under way.

Project: 600-mile line from Russian fields to Czechoslovakia.

Status: Planned for 1960.

Project: Line from Russian fields to East Germany, possibly as part of a petrochemical expansion program.

Status: Planned.

- **Yacimientos Petroliferos Fiscales (Argentina),** Buenos Aires.

Project: 815 miles of 12-in. from Campo Duran to San Lorenzo.

Status: Under way.

Contractor: **SARGO** (Fish Engineering Corp., Fish Northwest Constructors, Inc., Clark Brothers, North American Utility, Construction International Co.).

Completion: Mid-1960.

Project: 390 miles of 14-in. from fields in Neuquen Province, Argentina, to Bahia Blanca on the coast.

Status: Bids requested.

Project: 625 miles of 12-in. from Mendoza to San Lorenzo.

Status: Planned.

Foreign Products Pipelines

- **Kuwait Oil Co., Ltd.,** London.

Project: 12 miles of 16, 20, 24-in. on Ahmadi North Pier.

Status: Under way.

Completion: First quarter 1959.

- **National Iranian Oil Co.,** Azna, Iran.

Project: 200 miles of 6 and 8-in. extension of the Trans-Iranian line from Teheran northward to Resht on the Caspian Sea.

Status: Under way.

Contractor: **B. & M. Construction Co.,** Oklahoma City; **Cheney Construction Co.,** Seattle; **Merritt-Chapman & Scott,** New York City.

Completion: April 1959.

- **Union of Soviet Socialist Republic.**

Project: 2,315 miles of 28-in. Trans-Siberian crude-products line from Ufa Tuimaza fields in Bashkiria to Irkutsk near Lake Baikal.

Status: Under way.

- **Yacimientos Petroliferos Fiscales (Argentina),** Buenos Aires.

Project: 652 miles of 10-in. from Lujan de Cuyo to Buenos Aires.

Status: Bids opened August 1958.

Foreign Natural Gas Pipelines

- **Attock Oil Co., Ltd.,** London.

Project: 60 miles of line from Dhulian field to Rawalpindi in West Pakistan.

Status: Planned.

- **Cuban Gas Transmission Co.**

Project: 500-mile line from Campeche area of Mexico across Yucatan and a 150-mile line on the ocean floor to Havana.

Status: Under study by **Ebasco Services.**

- **Gaz de France.**

Project: 550 miles of 16 to 24-in. from Lacq field in southwestern France to Paris, plus 12 to 16-in. laterals to Lyons, making a 1,000-mile system.

Status: Under way.

Contractor: French contractors.

Completion: Line to Lyons to be completed March 1959; line to Paris in 1960.

- **Japan Gas Chemical Industries.**

Project: 10 miles of 10-in. from its company-owned fields to plants in Niigata, Japan.

Status: Under way.

Completion: Spring 1959.

- **Mene Grande Oil Co.,** Caracas, Venezuela.

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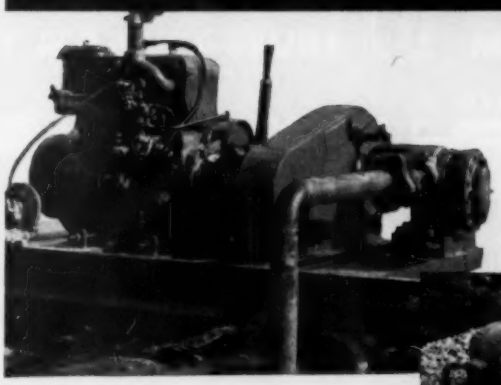

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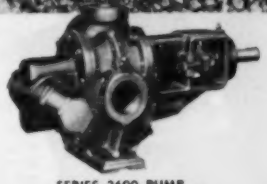

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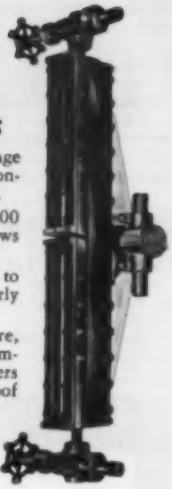

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PIPELINE CONSTRUCTION

Project: 20 miles of 12-in. from Soto to Mata.
Status: Planned.
Completion: 1959.

- **Petroleos Mexicanos,** Mexico D. F.

Project: 130 miles of 22-in. to parallel a 14-in. line from Reynosa to Monterrey.
Project: 490 miles of 24-in. artery from Jose Colomo field in the State of Tabasco to Mexico City.
Status: Preliminary work under way.
Completion: March 1960.

- **Sui Gas Transmission Co.,** Multan, Punjab, India.

Project: 130-mile extension of the new 310-mile, 16-in. Multan-to-Sui, Pakistan line. Extension will terminate at Lyallpur.
Status: Planned.

- **Union of Soviet Socialist Republic.**

Project: A 465-mile line from Karadag near Baku to Tbilisi and Erevan.
Status: Under way.
Completion: 1960.
Project: A 127-mile line across the Turkmenian Desert from Kizyl-Kum to the Caspian Sea port of Krasnovodsk.
Status: Under way.
Project: Two parallel lines, each over 1,200 miles long, from Gazly, near Bukhara, northward to Sverdlovsk and Chelyabinsk.
Status: Proposed.
Project: Line from near Bukhara, through Tashkent to Chimkent, Dzhambul, Frunze, and Alma-Ata near the border.
Status: Proposed.
Project: Line from Sverdlovsk to Omsk, Kemerovo and Tomsk.
Status: Proposed.
Project: Line from Berezovo field to Sverdlovsk.
Status: Proposed.
Project: Line from Stalingrad to Gorky and to Moscow.
Status: Proposed.
Project: Line from Dzhebol field to Izhevsk and to Sverdlovsk.
Status: Proposed.
Project: Line from Gorky to Kazan.
Status: Under way.
Project: Line from Saratov to Sverdlovsk, with branches into Stepanovskoe field.
Status: Proposed.
Project: Line from Kanevskoe (Kransnodar) field to Sulkhumi.
Status: Proposed.
Project: Line from Shebelinka field to Rostov, to Odessa, and northward to connect with proposed line from Lvov to Leningrad.
Status: Proposed.
Project: Line from Riga to proposed line from Lvov to Leningrad.
Status: Proposed.
Project: Line from Rostov to Moscow.
Status: Proposed.
Project: Line from Severo-Stavropolskoe (North Stavopol) field to Moscow.
Status: Under way.
Project: Line from Leningrad to Moscow.
Status: Under way.

- **Yacimientos Petroliferos Fiscales (Argentina),** Buenos Aires.

Project: 1,015 miles of 24-in. from Camp Duran to Buenos Aires.
Status: Under way.
Contractor: **SARGO** (Fish Engineering Corp., Fish Northwest Constructors, Inc., Clark Brothers, North American Utility, Construction International Co.), subcontracted to COGAR (River Construction Corp., Ft. Worth, Tex.), Milton Brazier, supt. for 700 miles from Buenos Aires to Tucuman, office at Buenos Aires; E. L. "Tex" Maggard, supt. for 400 miles from Campo Duran to Tucuman.
Completion: August 1960.

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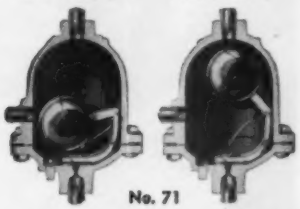
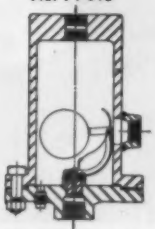


No. 71

Spring holds valve tight until float buoyancy overcomes spring pressure. Then spring snaps up, opening valve wide. Before all water leaves trap, valve snaps closed.

FORGED STEEL No. 71-315



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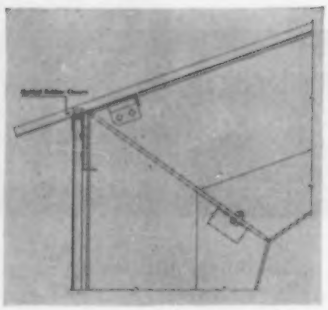
Like all Armstrong products, these traps are *unconditionally guaranteed* to satisfy. Call your local Armstrong Representative, or write Armstrong Machine Works, 8684 Maple St., Three Rivers, Mich.

How to Select TRAPS

Free Bulletin 289 gives complete selection data on ball float traps for draining water and *light liquids*. Ask for your copy. No obligation.



Section through eave showing molded rubber closure between siding sheet and roofing sheet. Also shown are eave strut and bracing connection to rigid frame.

...top utility at lowest cost

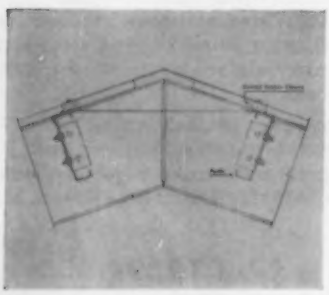
Here's ideal, low-cost, top-utility housing for oil field pump stations and compressor stations, refinery, bulk station operations. It's the new Truscon all steel "Budget Building."

Basic framework is of rigid frame design, shop fabricated from hot rolled structural sections, complete with connection plates and anchor bolts. Purlins and girts are cold formed channel sections.

Roofing and siding are 26-gage galvanized roll formed ribbed sheets, 24-inches wide and in continuous lengths. Sheets are rolled from Republic tight-coated, continuous hot dip galvanized steel . . . will not flake, peel or crack. No painting needed.

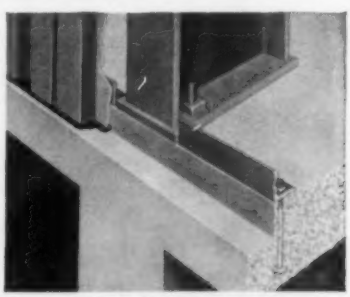
Truscon "Budget Buildings" are available for immediate delivery in widths of 32, 36, 40, 44 and 48 feet—12- and 14-foot heights, in any length necessary. Orders are filled fast from "off-the-shelf" stocks of pre-engineered materials. Roofing, siding, windows, doors and hardware are shipped to the job site as a package.

Learn more about Truscon "Budget Buildings". Send for full color brochure.



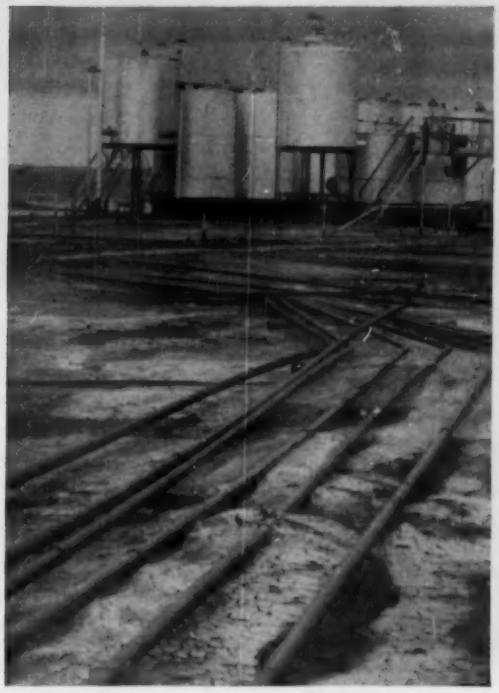
Section through ridge showing molded rubber closure between rigid cap and roof sheet. Also purlin connection to rigid frame. Connections make building weathertight.

Section through sidewall at girt showing girt connection to rigid frame and fastening of sidewall to girt. Strong, sturdy building can be erected fast at the job site.



Section through sidewall at sill showing curb angle, rigid frame anchorage and siding detail. All connection plates, connection bolts and anchor bolts furnished complete.

REPUBLIC ALLOY STEELS provide the oil field equipment builder a wide variety of analyses to produce lighter, more efficient designs with no sacrifice of strength or safety. Hardness resists abrasion; toughness and ductility resist impact and heavy loads. Ideal for bits, tongs, elevators, blocks, chain, sucker rods, draw work components. For more information, send coupon.



REPUBLIC'S COMPLETE LINE OF PIPE PRODUCTS range from continuous butt weld, shown above, to big diameter fusion weld line pipe. For data on sizes and types, mail coupon.

REPUBLIC ELECTRUNITE® GROOVED-END TUBING goes hand-in hand to serve your temporary, semi-permanent and permanent piping system needs. The combination of Republic ELECTRUNITE Light Weight Grooved-End Tubing and Victaulic "Vic-Easy" method of coupling saves installation time and reduces operating costs. Write today for attractive, illustrated brochure.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
Dept. OG-5213-A
1441 Republic Bldg., Cleveland 1, Ohio

Please send the following information as soon as possible:

☐ Truscon "Budget Buildings" ☐ Republic Alloy Steels
☐ Oil Country Pipe Products ☐ Grooved Tubing Brochure

Name_____ Title_____

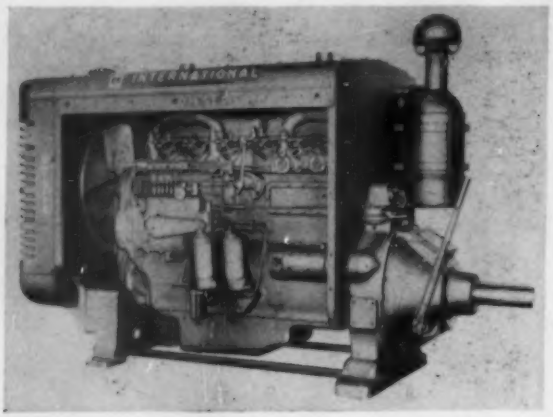
Firm_____

Address_____

City_____ Zone____ State_____

▶ ▶ ▶ New Equipment Section

This week's SHOWCASE features . . .



Industrial diesel power unit

. . . comes in four models with ratings of 65 through 121 hp. in both four and six-cylinder types. Fast heat dissipation to the cooling water is obtained by use of thin-wall, replaceable sleeves. The pistons are aluminum alloy, and the top piston rings are chrome-plated.

Overhead valves are used. They have positive rotators to keep the stems and seats free of deposits.

Many of the parts are interchangeable between engines. These include cylinder sleeves, pistons, connecting rods, and injectors. **Write or call: International Harvester Co., 180 North Michigan Avenue, Chicago 1, for details on new diesel power units.**

Tension-control motor base

. . . promises to extend belt life on oil-well pumps and other applications. The motor base is designed for NEMA motor-frame drives in ratings through 100 hp.

Three sizes of the Econ-O-Matic motor base are available for NEMA motor frames 405, 445, and 505. It is an all-steel mounting that automatically controls belt tension and prevents belt slippage and speed loss at peak load.

The base reduces average belt tension by almost 50% as compared to older types of mountings. It eliminates the need to adjust belt tension. It consists of a cradle type of motor base supported on built-in slide rails with a screw takeup, and a lateral adjustment for belt alignment.

The cradle pivots in ball-and-socket self-aligning bearings. **Write or call: American Pulley Co., 4200 Wissahickon Avenue, Philadelphia 29, for details on Econ-O-Matic motor base.**

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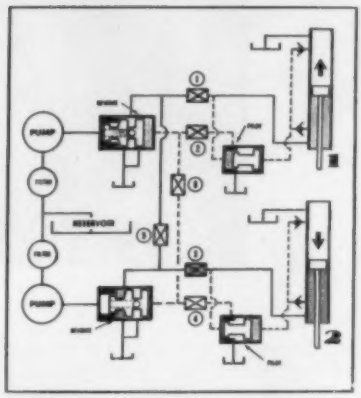


Hydraulic pumper handles two zones

. . . as it reciprocates two sucker-rod springs that terminate at different depths using conventional subsurface pumps. Two separate hydraulic circuits with interconnecting valves allow both pumps to cycle either well cylinder simultaneously. One feature of the double-piston surface hydraulic pumping unit is that by opening two valves and closing two others, you can operate one cylinder with the discharge from both power pumps.

All equipment for the pumping unit mounts on one base. The two wellhead cylinders are mounted one above the other and offset enough to accommodate the wellhead dual spacing plate. They are mounted to a quadruped which is securely bolted to the unitized base.

The pumping rate of each well is controlled by the hydraulic pump speed. This pump determines the time for each upstroke. Cylinder diameters may be changed according to the applicable well loads. The design of the hydraulic dual pumping unit is expected to make it particularly suited for stroke lengths of 4, 6, and 10 ft.

Thus a 4-ft. stroke could be used for one zone and a longer one for the other. **Write or call: Axelson Mfg.**

Send this **Showcase Coupon**

to the **Manufacturer** of the item in which you are interested. See name, address, and equipment name and/or model, in bold-face type at end of description.

NAME AND/OR MODEL NUMBER.....

.....

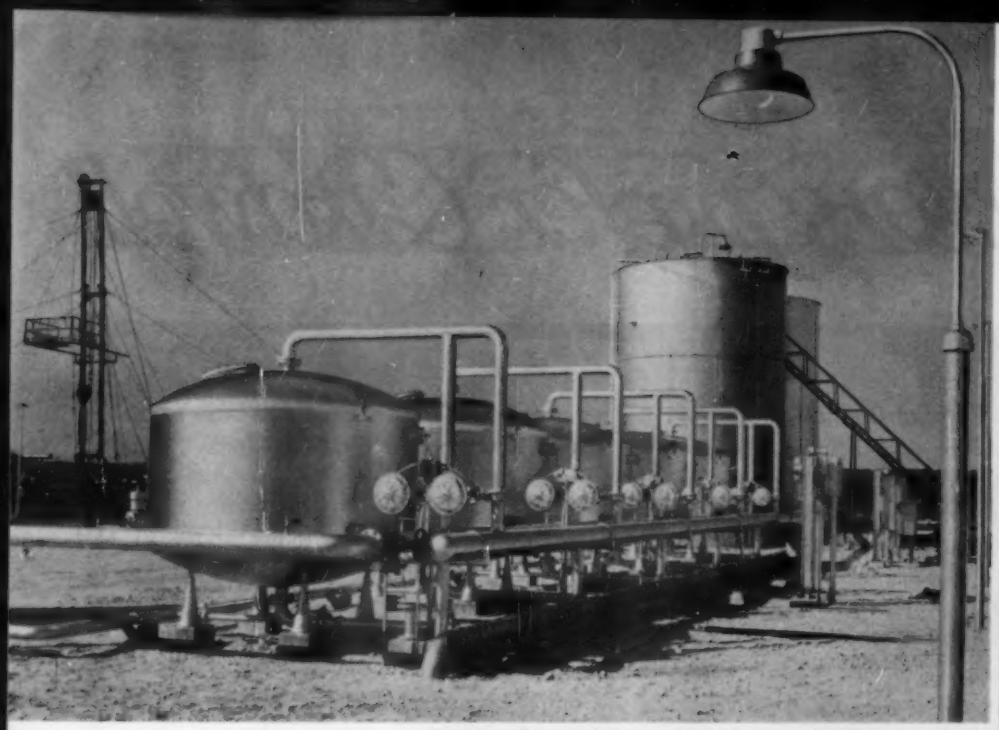
Described in OIL AND GAS **JOURNAL** - Issue of **Jan. 26, 1959**

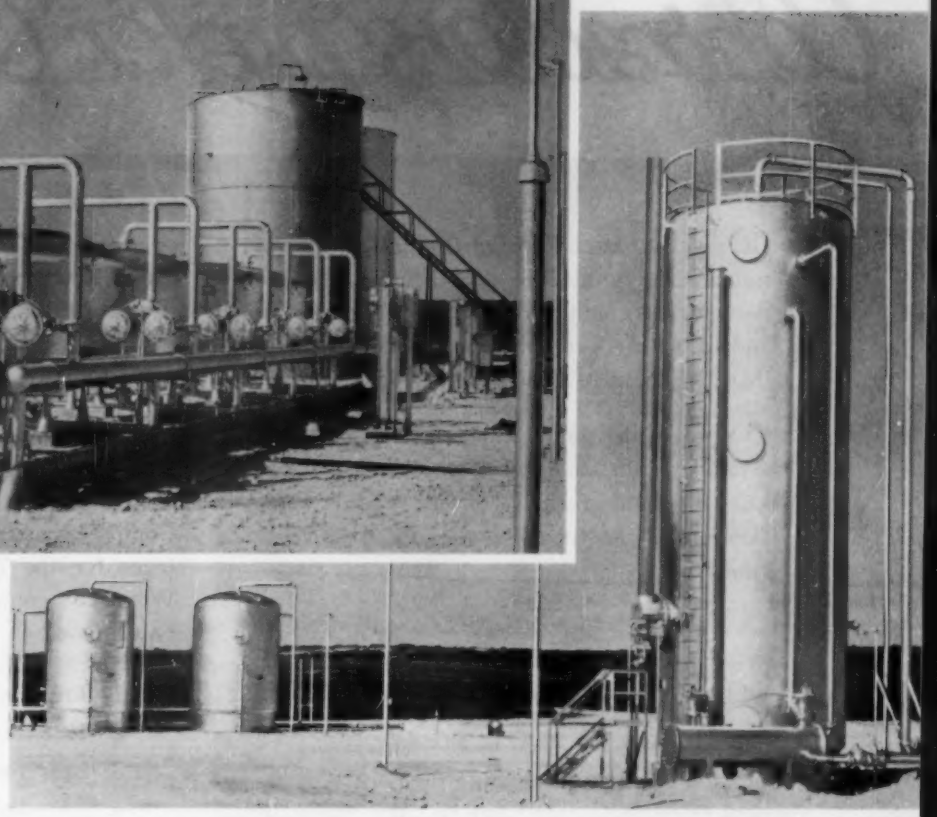
NAME.....TITLE.....

COMPANY.....

ADDRESS.....

CITY.....STATE.....





Automatic Waterflood System . . .

Utilizes BS&B AQUA-Kleener!® Filters, Oilfield Equipment and Controls

Down in Mid-Texas, there's a "young" waterflood just getting well started that operates on a completely *automatic* basis — with the aid of 5 BS&B AQUA-KLEENER Filters, 2 BS&B Free Water Knockouts, a BS&B Type S Treater, several BS&B Bolted Steel Tanks and numerous BS&B Controls. These include valve actuators, time clock controls, liquid level controls and pressure differential controls.

In this system, production water from the treater and the free water knockouts is combined with "source water" from 2 750-bbl. tanks (fed by 2 water wells), and is pumped through the filters to the injection pumps, and thence into several injection wells.

The 5 filters are controlled by a preset time clock on a cycle that keeps some of them on stream while others are on automatic backwash. The piping manifold on the filters and twin valves is so arranged that when the time clock closes the inlet valve, it opens the other valve starting the backwash cycle.

This installation is a good example of BS&B "Oilfield Automation" at work. Why not let your BS&B Man help you put your operations on an automated basis, too?

BS&B — ANOTHER EXAMPLE OF PRODUCT LEADERSHIP

BLACK, SIVALLS & BRYSON, INC., DEPT. 1-A1 P. O. BOX 1714, OKLAHOMA CITY

Contractors prefer Cardwell

Cardwell TRAVELRIGS are the choice of contractors and producers alike because they are designed and built to reduce the producer's cost and to make a profit for the contractor, too... that's why they're *always* in demand.

These new drive-in members of the TRAVELRIG series are outstanding, self-propelled, servicing units designed and built for dependable operation under the toughest of roading and field conditions.

The unit, oil field power package and structural mast, is mounted on a special heavy-duty carrier designed for both road and off-hiway travel.

These units have more usable horsepower and provide more power through the hoist. A torque converter drive provides smooth cushioned handling of rods and tubing.

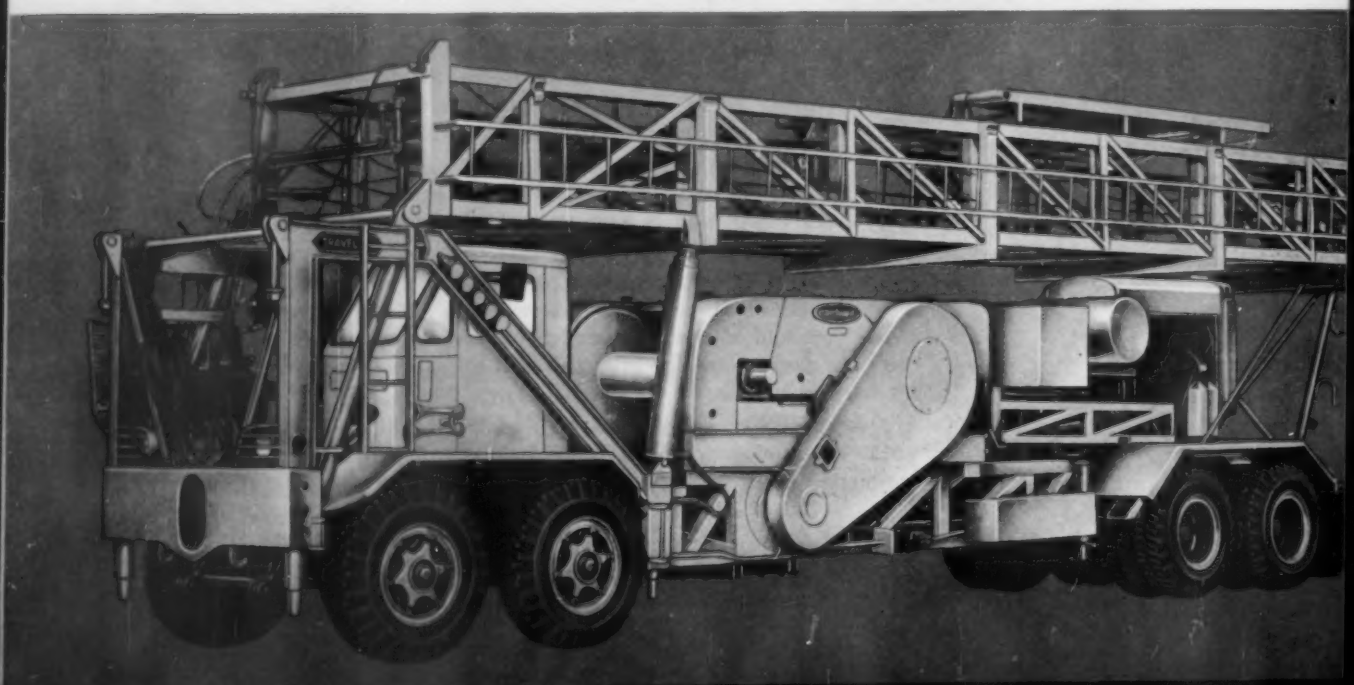
Cardwell TRAVELRIGS are fast, efficient, and dependable and are designed and built to make a profit for the contractor, under today's competitive conditions.

The contractor can expect to get more work, and a better profit from a Cardwell TRAVELRIG because the producer will get faster, less costly service, and a longer life for his well equipment.

Compare these features that provide big advantages for the contractor and producer alike. When you count all the costs – you can count on Cardwell –

1. Less road time from yard to location.
2. Less rig-up time on location.
3. Less trip time.
4. Less damage to rods and tubing.

Let Cardwell show you why both producers and contractors prefer a Cardwell TRAVELRIG.



TRAVELRIGS!

CARDWELL MODEL KM250

For Servicing and Workover to 15,000 feet

Consists of a single-drum or double-drum hoist with 96-foot telescoping structural mast on rugged heavy-duty carrier. Powered by single oilfield-type engine with torque converter. Double end main drum drive, with high and low clutches outboard-mounted for easy accessibility. Six speeds forward and two reverse are available to main drum. Three speeds forward and one reverse to sand drum. Free-standing mast has 170,000-lb. capacity. Rotary drive and hydromatic brake optional.

CARDWELL MODEL M200

For Servicing and Workover to 10,000 feet

This "junior" model in the highly maneuverable Cardwell "Travelrig" series is extremely compact and lighter in weight. Single-drum or double-drum hoist is mounted with 90-foot telescoping structural mast on a heavy-duty carrier of adequate weight to withstand excess load stresses. The M200 is powered by a single oilfield-type engine with torque converter. Three forward speeds are available to both main drum and sand drum. Cardwell Flex-Disc clutches are standard on both main drum and sand drum. Free-standing mast has 170,000-lb. hook load capacity. Rotary drive optional.

For Tomorrow's equipment—Keep your eye on Cardwell Today.

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Throughout the world—Wherever oil is found—You'll find a Cardwell man close by!

ONLY FROM KUHNS

DUCTILE

IRON PIPE FITTINGS

Kuhns long lasting ductile iron pipe fittings for high strength and corrosion resistance are pressure rated by Underwriters' Laboratories, Inc. Most types and sizes are stocked for prompt delivery, along with our complete line of high quality cast and malleable iron fittings. Write for catalog today.

THE KUHNS BROTHERS CO.

1800 McCall St. • Dayton, Ohio

OVER 3,000 SHAPES AND SIZES

Co., 5947 Shiela Street, Los Angeles, for details on hydraulic dual-zone pump unit.

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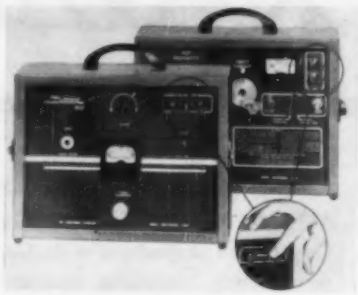


Pipe detector design improved

. . . through newly designed circuit and internal construction. The signal of the Detectron Model 505 pipe detector has a much sharper cut-off to more accurately determine the exact number of pipes which may lie in the path of a bulldozer or ditching machine than older models. This greater accuracy reduces the possibility of cutting unknown pipes as two closely parallel pipes, which formerly showed as one, can now be detected independently.

The circuit now used gives a more-stable field signal, reducing the possibility of false signals frequently caused by static and minor changes in the mineral content of the soil. **Write or call: Computer Measurements Corp., Dept. 103A, 5528 Vineland Avenue, North Hollywood, Calif., for details on Model 505 pipe detector.**

•

Tractor sideboom attachment

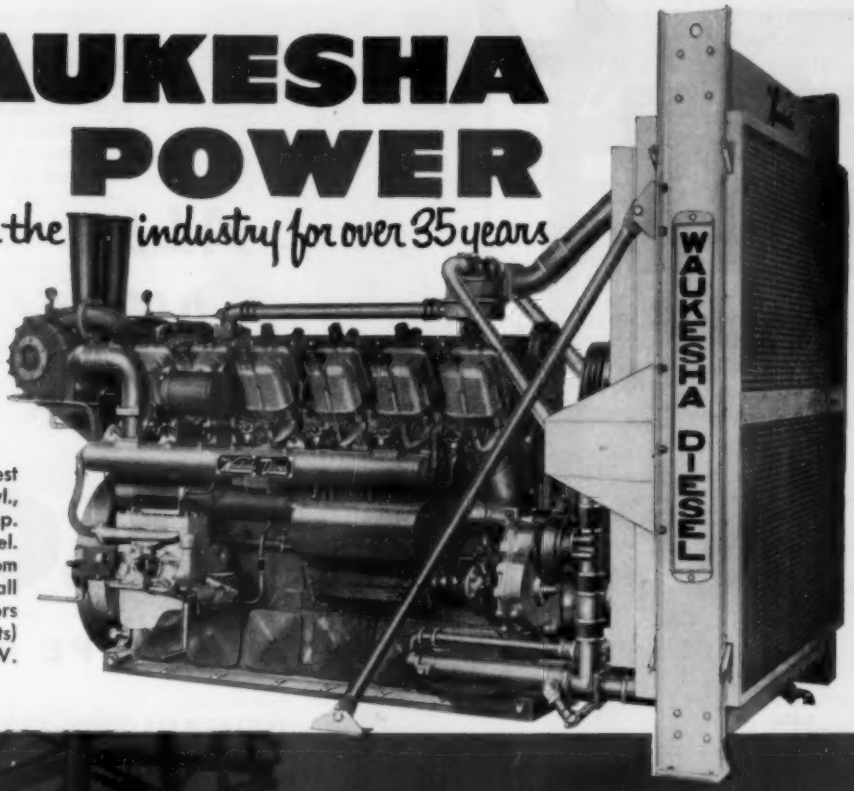
. . . for Hough tractor-shovels is hydraulically controlled. The 10-ft. boom gives a maximum lifting capacity of 5½ tons. It is easy to adjust in 2-ft. increments and telescopes from 10 to 16 ft.

A hydraulically extended boom is also available. A lifting device gives positive control of the boom and prevents danger to the operator from boom cables when the boom is lowered into a working position.

Installed on a tractor-shovel, the boom permits the operator to load,

WAUKESHA POWER

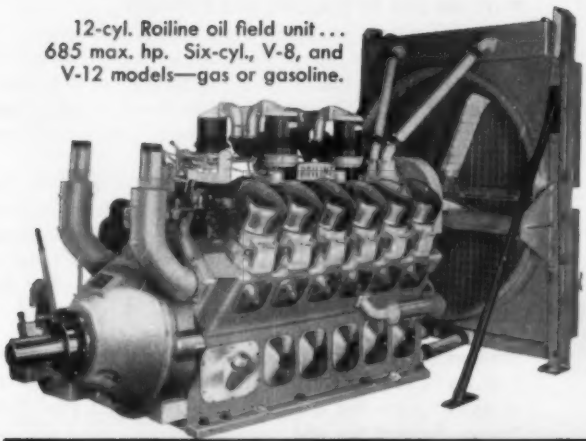
dominant in the industry for over 35 years



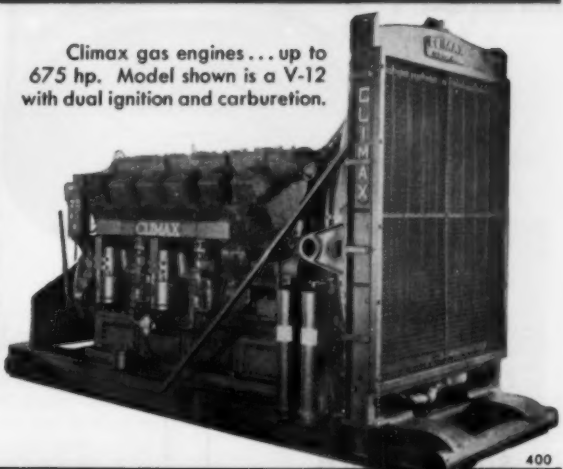
One of the biggest Waukeshas—a 12-cyl., 5788 cu. in., 1235 hp. turbocharged Diesel. Complete line ranges from 10 hp. for use with all standard fuels. Enginators (engine-generator sets) to 800 KW.

Since they first entered the oil fields, back in 1922, Waukesha engines have earned an enviable reputation for reliability and long, useful service. Now . . . long famous for its wide range of models, Waukesha's recent acquisition of the well-known Climax and ROILINE (formerly LeRoi) oil industry engines makes available a variety of sizes unmatched by any other engine builder—complete coverage to over 1200 horsepower, for use with all standard fuels.

12-cyl. Roiline oil field unit . . . 685 max. hp. Six-cyl., V-8, and V-12 models—gas or gasoline.



Climax gas engines . . . up to 675 hp. Model shown is a V-12 with dual ignition and carburetion.

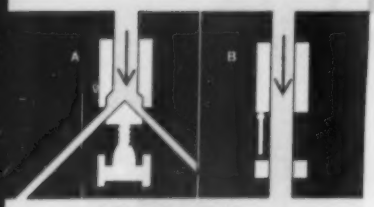


400

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN • NEW YORK • TULSA • LOS ANGELES

Factories at Waukesha, Wisconsin and Clinton, Iowa

Photo shows unrestricted bore through FULL-FLOW Drill Pipe Float Valve

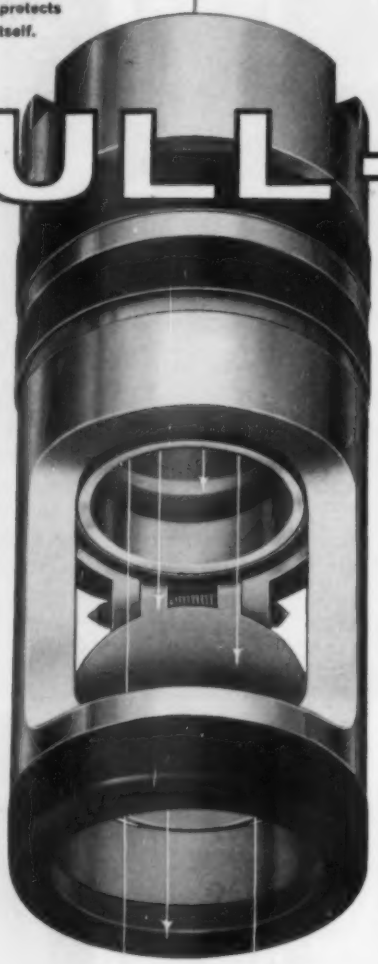


A Fluid diverted by poppet valve causes wear on drill collar I.D.

B Undiverted flow through FULL-FLOW Valve protects drill collar, Valve itself.

ALL NEW BAKER FULL-FLOW

DRILL PIPE FLOAT VALVE



RUGGED ONE-PIECE CAGE

FASTER-ACTING FLAPPER VALVE

VIBRATION-DAMPENERS AT THREE VITAL LOCATIONS

Available only through your supply store

OUTLASTS ALL OTHERS 2 TO 3 TIMES

Here, at last, is a drill pipe float valve that lasts 2 to 3 times as long as any other and at the same time gives maximum protection against fluid-cutting of drill collar I.D.'s.

ELIMINATES SOURCE OF WEAR ON DRILL COLLAR I.D.

Use of the special-design flapper valve in the Baker *Full-Flow* Drill Pipe Float Valve eliminates diversion of the circulated drilling fluid against the bore of the drill collar, thus not only protecting the expensive drill collar but prolonging the life of the valve itself.

PROTECTED AGAINST VIBRATION DAMAGE

Vibration dampeners, provided at the three principal locations of vibration wear, greatly extend the life of the valve.

PUTS AN END TO PULLING WET STRINGS

The faster-acting flapper valve CLOSES immediately circulation is stopped, to prevent cuttings from entering and plugging the drill pipe, OPENS immediately the first joint is raised—no more waiting several joints for the valve to open—no more safety hazards and lost time due to mud spill-over on the rig floor.

Feature for feature the new Baker *Full-Flow* Drill Pipe Float is designed to give longer wear-life—greater convenience—better value than any other drill pipe float available. It's easily installed too, in either a bored-out drill collar or, if you prefer, in the Baker Drill Pipe Float Body which then serves as a tool joint sub.

WHICHEVER WAY YOU CHOOSE TO INSTALL IT, CHOOSE THE LONGEST-LASTING DRILL PIPE FLOAT AVAILABLE IN THE MARKET TODAY—THE BAKER FULL-FLOW DRILL PIPE FLOAT VALVE, Product No. 483.

BAKER OIL TOOLS, INC.
HOUSTON • LOS ANGELES • NEW YORK

unload, string, and lower all types of pipe, set valves, or reclaim pipe. The boom can also serve as a crane for erection lifting, spotting, and placing of materials and equipment within its capacity range. **Write or call: Frank G. Hough Co., Seventh Avenue, Libertyville, Ill., for details on side-boom attachment for Model HD tractor-shovels.**

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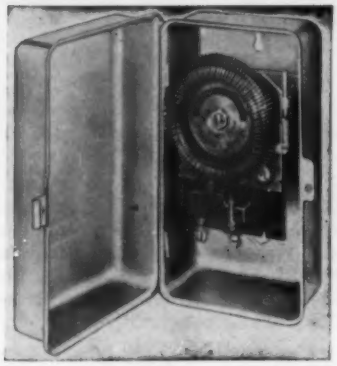
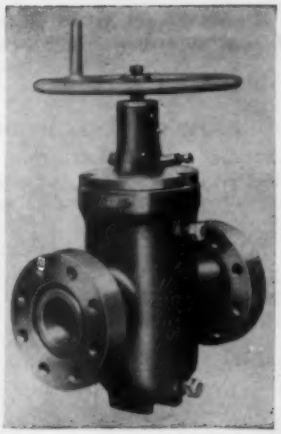


Time switch for oil-well pumps

. . . has built-in random start that prevents two pumps in a field from coming on at the same time. It thus protects equipment and wiring against overload of initial surge current. This feature can be particularly valuable in event of power failure.

Any variety of on-off pumping schedules can be set on the program switch. It has 96 built-in tabs. Each represents a 15-minute period. The tilt tabs are set by hand.

The Model 8005 switch comes in models for 120, 208-240, and 440-volt power. **Write or call: Tork Time Controls, Inc., Mount Vernon, N. Y., for details on Model 8005 switch.**



Through-conduit gate valve

. . . for oil-field and wellhead use is designed to achieve a tight seat by use of a pressure-seal type of bonnet that makes a metal-to-metal contact with the valve body on an annular face grooved for a Teflon ring. A flanged ring holds the bonnet in position. The ring is in threaded engagement with the valve body.

Locking is obtained by a set screw. An O-ring on the underside of the flange protects the threads from corrosive fluid and foreign matter. Another O-ring in the bonnet ring keeps foreign matter from entering the annular space between the bonnet neck and the bore of the ring.

Made in England, the cast-steel valve comes in sizes of 2 through 4 in. with flanged or screwed ends in working pressures of 2,000 through 5,000 psi. **Write or call: Triangle Valve Co., Ltd., 315 Regent Street, London W L, England, for details on oil-field gate valve.**

Rigid PVC expansion joint developed

. . . which is fully guided even when completely extended. Maximum traverse of the expansion joint is 4 in. It can be used to compensate for variations in length on long straight runs of both normal impact and high-impact PVC pipe due to changes in temperature. Special O-rings are used in the joint to obtain a tight seal.

The joint will hold at pressures above five times the maximum recommended pressure for the equivalent size Schedule 80 pipe, the maker says. Available sizes are ½ through 4 in. with threaded, flanged, or socket-welded ends. **Write or call: Walworth Co., 750 Third Avenue, New York, for details on PVC expansion joint.**

Look for the
BAKER
FULL-FLOW
Drill Pipe Float Valve
AT YOUR SUPPLY STORE!

this new package!

this new display!

For complete information write for Catalog Supplement No. 349.

BAKER OIL TOOLS, INC.
HOUSTON • LOS ANGELES • NEW YORK

Tube connector is now hardfaced

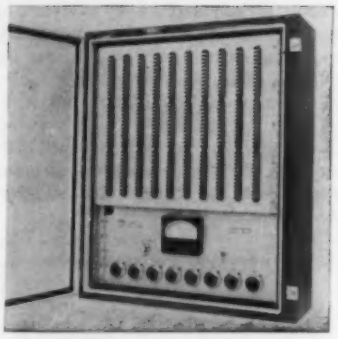
. . . with a new material called Axite. The material used on the traveling type of upper-barrel tube connector has microconstituents in the hardness range of a sapphire rating of 9 on the Mohs Scale. Diamonds have a rating of 10. The material has a high resistance to wear and abrasion and a greatly reduced coefficient of friction.

Its density and high-nickel content often protect parts from failure due to corrosion fatigue. **Write or call: Axelson Mfg. Co., 5947 Sheila Street, Los Angeles 22, for details on Axite hard-faced upper-barrel tube connector.**

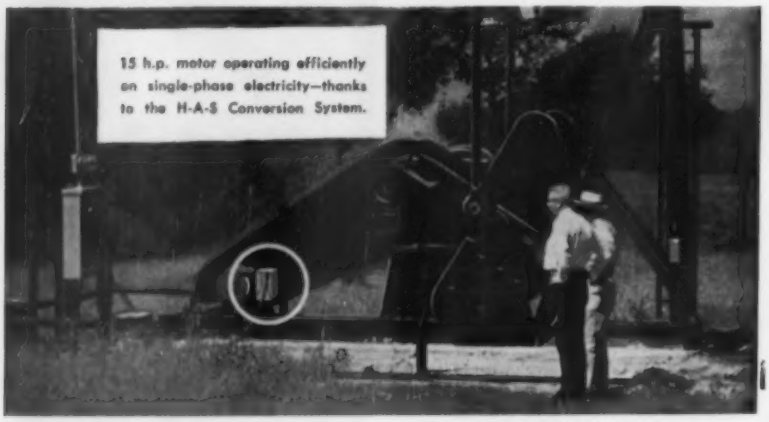
All-purpose analog computer

. . . promises increased efficiency and product purity when used for computation and control of process variables. The computer uses transistors and magnetic amplifiers instead of tubes to achieve the reliability and ruggedness needed for industrial applications.

It consists of operational amplifiers, logarithmic networks, and scaling potentiometers. Housed in a steel cabinet with door, the CM-2 computer has hermetically sealed units mounted on swingout frames for fast access.



Each cabinet can house up to 12 operational amplifiers, 6 logarithmic networks, and 8 scaling potentiometers. **Write or call: Southwestern Industrial Electronics Co., P. O. Box 13058, Houston 19, for details on CM-2 analog computer.**



Write for this NOW!

"How to use three-phase motors on SINGLE-PHASE CURRENT"

. . . and profit from the added economy and efficiency!

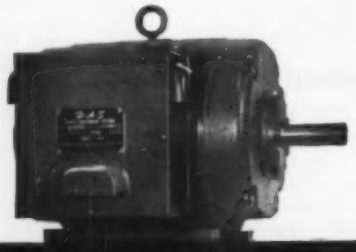
Three-phase motors cost less than single-phase motors, are more efficient and have far greater salvage value.

The New H-A-S Phase Conversion System enables you to use three-phase motors (3 h.p. or larger) on 220 V single-phase current. Three-phase motors cost less, operate for less, and can be used later on three-phase current.

The H-A-S is available in two models, for motor mounting and remote mounting.

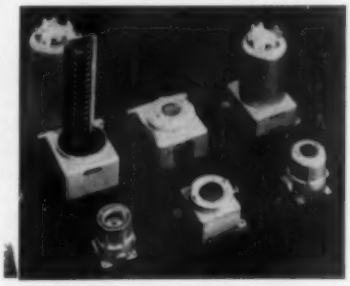
On many rural single-phase lines service is limited to 5 h.p. single-phase motors, but the H-A-S Phase Conversion System permits the use of three-phase motors up to 75 h.p.

This is GOOD NEWS in the oil country. To solve an immediate problem—or for your files—write NOW for complete details and the name of your nearest supply store or distributor!



KEN ELLIOTT MOTORS, Inc.
P. O. Box 5158-A
BOSSIER CITY, LOUISIANA

H-A-S PHASE CONVERSION SYSTEM



Explosionproof timing controls

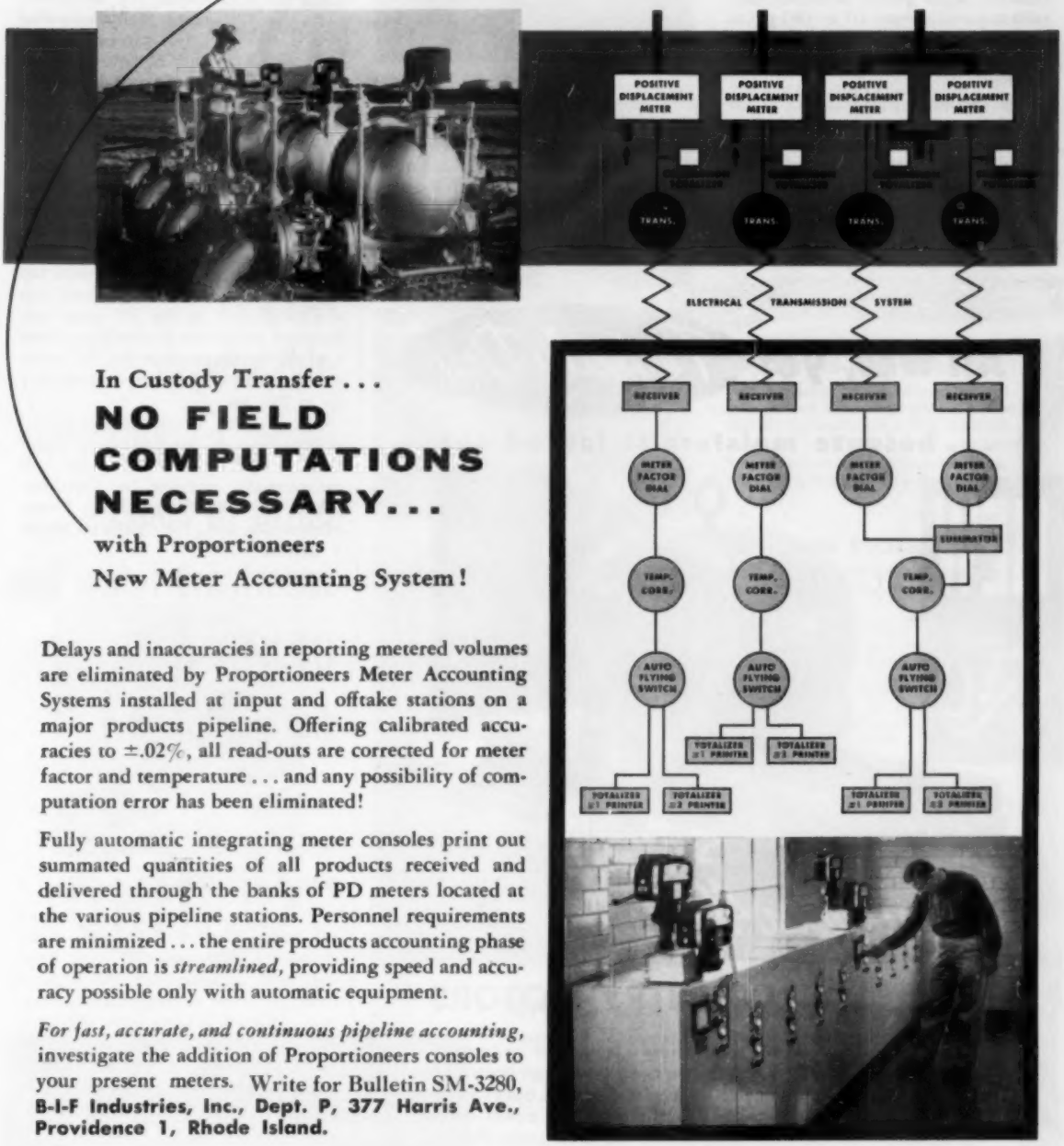
. . . offer time cycles from ⅓ second to 72 hours. They are for use in hazardous atmospheres of Class I, groups C and D, and Class II, groups E, F, and G.

The timers come in single and multicam units with 1 to 19 switches. Both time-delay and interval timers are available. The time-delay series (TDXP) is instant automatic reset. Available time cycles range from 1 second to 3 hours.

The interval timer comes in two series. Series INTXP is an automatic reset timer with a load rating of 15 amp. Time cycles range from 1 second to 3 hours.

The Series RSXP interval timer is a manual-set type with a load rating of 20 amp. Available time cycles range from 15 minutes to 60 hours. The timer has an adjustment knob that indicates elapsed time and initiates the time cycle. **Write or call: Industrial Timer Corp., 1407 McCarter Highway, Newark 4, N. J., for Bulletin 800.**

POSITIVE CONTROL OF MATERIALS IN MOTION



In Custody Transfer . . .

NO FIELD COMPUTATIONS NECESSARY...

with Proportioneers
New Meter Accounting System!

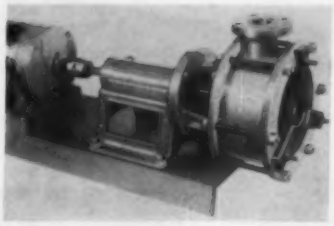
Delays and inaccuracies in reporting metered volumes are eliminated by Proportioneers Meter Accounting Systems installed at input and offtake stations on a major products pipeline. Offering calibrated accuracies to ±.02%, all read-outs are corrected for meter factor and temperature . . . and any possibility of computation error has been eliminated!

Fully automatic integrating meter consoles print out summated quantities of all products received and delivered through the banks of PD meters located at the various pipeline stations. Personnel requirements are minimized . . . the entire products accounting phase of operation is *streamlined*, providing speed and accuracy possible only with automatic equipment.

For fast, accurate, and continuous pipeline accounting, investigate the addition of Proportioneers consoles to your present meters. Write for Bulletin SM-3280, **B-I-F Industries, Inc., Dept. P, 377 Harris Ave., Providence 1, Rhode Island.**

B-I-F INDUSTRIES
BUILDERS-PROVIDENCE • PROPORTIONEERS • OMEGA

Wetted pump parts made of plastic



. . . to obtain high chemical resistance. The wetted parts are made of unplasticized, unmodified polyvinyl chloride. Four pump sizes are made with capacities from 10 to 180 g.p.m. and discharge heads to 100 ft. Solution temperatures to 140° F. can be handled.

The sectioned plastic casing is protected by a cast-iron frame. Mechanical seals are used on the pump shaft. Pumped fluid contacts only the facings of rotating and stationary rings. The casing can be opened and the impeller inspected by removal of only six bolts. The shaft can be removed from the pump from either direction. **Write or call: Vanton Pump & Equipment Corp., Hillside, N. J., for details on plastic pump.**

V-belt drive smaller but stronger

. . . than older types has been developed and promises higher capacity at lower costs. Many industrial drives can be handled with belts only ⅜ in. wide and sheaves greatly reduced in both width and outside diameter.

The Dyna-V drives are obtainable in two standard groove sizes to meet all but the largest industrial requirements. The sizes are the 3V, ⅜ in. nominal top width, and 5V, ⅝ in. nominal top width. Sheaves in the 3V series are designed for drives transmitting from 1 to 50 hp. Sheaves in the 5V series are designed for drives transmitting up to 200 hp.

The V-belts, besides being smaller in cross-section, are lighter in weight and stronger than older types and exceptionally immune to stretching. **Write or call: Dodge Mfg. Corp., Mishawaka, Ind., for details on Dyna-V drives.**

All wet, yet Perfectly Dry

. . . because moisture is locked out

NEW R&M

"All Weather 40"

OIL COUNTRY MOTORS

Here's how R&M "weatherizes" motors! It undercoats steel parts with a rust-resistant . . . treats iron parts with anti-corrosion primer . . . varnish-dips and bakes windings twice. Terminal box is gasketed . . . power leads sealed at shell. Baffles lock out wind-driven rain. Rodent screens are factory-installed. Yet these dependable R&M 40° heat rise motors cost no extra! *Write today for Bulletin 520-OG!*

ROBBINS & MYERS, INC.

MOTOR DIVISION • SPRINGFIELD, OHIO

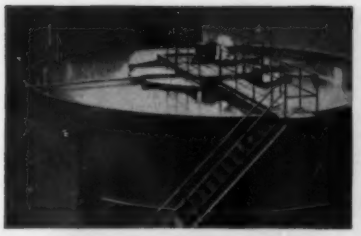
Pillow block for bearings

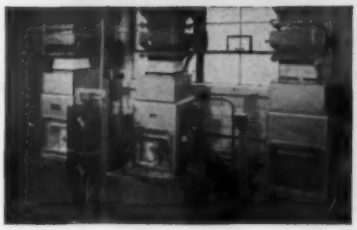
. . . accommodates all series of spherical roller bearings. Through interchangeable end caps, 20 basic housings will accommodate 94 separate bearings. Some housings take as many as 8 different bearing sizes and up to 11 separate shaft diameters. To install a different bearing size, just fit new end caps on the housing. End caps and housings are jig-drilled for interchangeability.

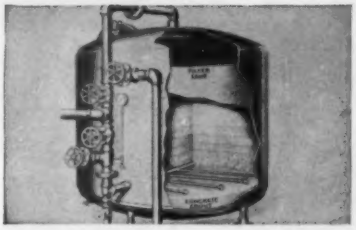
Housings are center-grooved for universal center lubrication. End caps have a second connection for side lubrication. Either labyrinth closures or oil seals are available on most caps. A reinforcing center rib is used on the one-piece housing to withstand severe shock loads. **Write or call: Miether Machine Works, P. O. Box 3907, Odessa, Tex., for details on pillow blocks.**

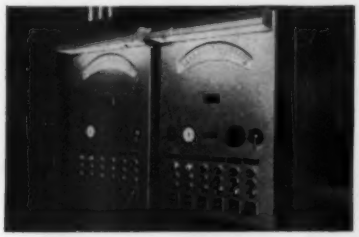
You get dependable performance for all types of brine and water treatment with INFILCO equipment

INFILCO









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plants for clarification, softening and stabilization
Effective mixing of chemicals and raw water with recirculating slurry and downflow separation effect better treatment in minimum area — and at low cost. For water, brine or waste treatment. BULLETIN 1825

CHEMICAL FEEDERS
Accurately controlled feed rates and maximum economy
Compact designs for automatic or manual control, for all types of chemicals. Type E Feeders dispense dry chemicals volumetrically, from bulk storage to dry or wet applications. BULLETIN 215

NEUSOL® FEEDERS
Wide feed range, corrosion resistant construction adapt this versatile and dependable displacement feeder to most chemical solution requirements. BULLETIN 340

AERATORS and DEGASIFIERS
For all types of gas-liquid transfer applications. Efficient oxidation, carbon dioxide and hydrogen sulfide removal. BULLETIN 106
Request information on recarbonators, deaerating heaters and vacuum degasifiers.

PRESSURE FILTERS
Standard or special construction for the most exacting process requirements
Vertical or horizontal, sand or anthracite types with manual or automatic controls for water or brine filtration. BULLETIN 1520
The STELLAR® diatomite filter, with its exclusive "gas-bump" cleaning is standard for amine solutions in most of the largest gas companies. BULLETIN 1560

MODERN INSTRUMENTATION
Maintains efficiency, reduces operating cost of treatment
Design and assembly of pneumatic, electric or hydraulic control components for manual or automatic, constant or variable rate plants. Operating consoles and control panels specifically engineered for complete treating plants. BULLETIN 1100

INFILCO CAN help you solve any water and brine treatment problem in oil production and refining

From experience, extending over 60 years, INFILCO can give you the best results with lowest *first* cost and *operating* costs.

No other line of equipment is so complete—none so advanced in method and design. Above are a few examples.

It will pay you to investigate. Inquiries are invited on all matters relating to water or brine treatment. Write today for new condensed catalog, Bulletin 80, for a more complete description of INFILCO products.

INFILCO
INCORPORATED
General Offices - Tucson, Arizona - P.O. Box 5033
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57402

THE ONLY COMPANY impartially offering equipment for ALL types of water and waste processing—coagulation, precipitation, sedimentation, flotation, filtration, ion exchange and biological treatment.

5802

CF&I SEAMLESS casing and tubing

THE COLORADO FUEL AND IRON CORPORATION · DENVER, COLORADO

New Literature

SHOWCASE . . .

Pneumatic bulk trucks

. . . for the handling of chemical and industrial materials are outlined in new four-page Bulletin 205. It illustrates various truck models and presents a diagram of the "on-board" air system which loads and unloads bulk solids. The bulletin discusses advantages of bulk handling and gives information on possible cost savings. **Write or call: Sprout, Waldron & Co., Inc., 130 Logan Street, Muncy, Pa., for Bulletin 205.**

Univac II data-processing system

. . . which offers a new high-speed system is outlined in a new six-page folder. The magnetic-core memory provides instantaneous access to 24,000 alphabetic or numeric characters. The folder includes photos of Univac II and lists its uses and advantages. **Write or call: Remington Rand Div., Sperry Rand Corp., 315 Fourth Avenue, New York City 10, for Folder U1395.**

New mixer bulletin

. . . discusses the theory of mixing and compares the range of operations of different types of mixing equipment. The bulletin also contains tables which will help you in the selection of mixer size for any specific application, depending upon the degree of mixing required. The material is divided into discussions of rapid and slow mixing, such as blending and flocculating, and gas-dispersing mechanical equipment. **Write or call: Infilco, Inc., 901 South Campbell Avenue, Tucson, Ariz., for Bulletin 730.**

Cast monel, nickel valves

. . . and their applications to corrosive environment are detailed in Bulletin 9. It also contains chemical and mechanical properties and illustrates several basic valve designs. **Write or call: Alloy Steel Products Co., Inc., 1340 Elizabeth Avenue, Linden, N. J., for Bulletin 9.**

Industrial enclosed switches

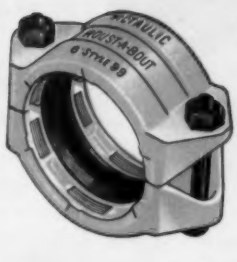
. . . are described in new 20-page Catalog 83c which gives complete details of nine housing groups of metal-enclosed switches. The 99 different listings shown include explosionproof, maintained-contact, prewired, hand-operated, and sealed switches. The catalog lists switches with a variety of actuator types, to fulfill almost

VICTAULIC®

METHOD OF PIPING

VICTAULIC HAS EVERYTHING...

VICTAULIC COUPLINGS
Simple, fast, reliable. *Styles 77, 77-D,* for standard uses with steel or spiral pipe, — *Style 75* for light duty. Other styles for cast iron, plastic and other pipes. Sizes ¾" to 60".

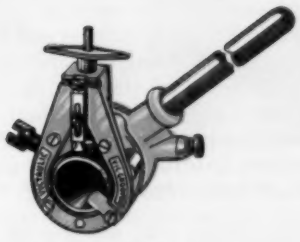


ROUST-A-BOUT COUPLINGS
For plain or beveled end pipe *Style 99.* Simple, quick, and strong. Best engineered and most useful plain end coupling made — takes a real "bull-dog" grip on the pipe. Sizes 2" to 12".

VICTAULIC SNAP-JOINTS
The new, boltless, speed coupling, *Style 78.* Hinged into one assembly for fast piping hook-up or disassembly. Hand locks for savings in time and money. Ideal for portable lines. Sizes 1" to 8".

COUPLINGS FOR EVERY PIPING JOB

VICTAULIC FULL-FLOW FITTINGS
Elbows, Tees, Reducers, Laterals, *a complete line*—fit all Victaulic Couplings. Easily installed — top efficiency. Sizes ¾" to 12".



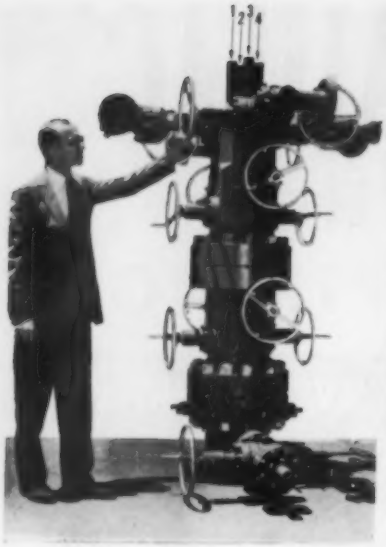
VIC-GROOVER TOOLS
Time saving, on-the-job grooving tools. Light weight, easy to handle — operate manually or from any power drive. Sizes ¾" to 8".

PLUS FITTINGS AND GROOVING TOOLS

"EASIEST WAY TO MAKE ENDS MEET"

Promptly available from distributor stocks coast to coast.
Write for NEW Victaulic Catalog-Manual No. E-1

VICTAULIC COMPANY OF AMERICA
P. O. BOX 509 • Elizabeth, N. J.



4 OIL WELLS IN ONE HOLE

The fortunate circumstance of 4 producing sands in one well means more today than ever before. The reason is Cameron's new quadruple completion equipment – the first of its kind. This equipment, which is already in service, includes all of the time tested features of the other highly successful Cameron multiple completions, plus a new unitized Christmas tree. Production strings may be run or pulled independently. The 4 segmented tubing hangers provide maximum clearance for running special tools. Each hanger segment will support full joint strength loads. There are triple seals for safety and positive orientation of hangers. Cameron's reliable back pressure valves afford complete control of well pressure through every phase of setting.

In this design only the size of the casing limits the number of parallel strings that may be hung. So with 1, 2, 3, 4 or even more pay zones, you may COUNT ON CAMERON for multiple production and multiple profits.

Cameron
IRON WORKS, Inc.
P. O. Box 1212-Houston, Texas
Export Office: 7912 Empire State Bldg., New York City. In England: Cameron Iron Works Ltd., 76 Grosvenor St., London W. 1, England

any requirement for general-purpose industrial enclosed switches. **Write or call: Micro Switch Div., Minneapolis-Honeywell Regulator Co., Freeport, Ill., for Catalog 83c.**

Accessories for control panel

. . . information systems are outlined in new four-page Bulletin 104. Accessories include liquid-level indicators which show fluid level at remote points; interlock receptacles for safe operation in hazardous places; mercury pushbutton and selector switches for Class I, Division 2 locations; plug-in tester for operation testing of relays; and mechanical pushbutton switches for panel mounting. **Write or call: Panellit, Inc., 7401 North Hamlin Avenue, Skokie, Ill., for Bulletin 104.**

Surface intermitters, motor valves

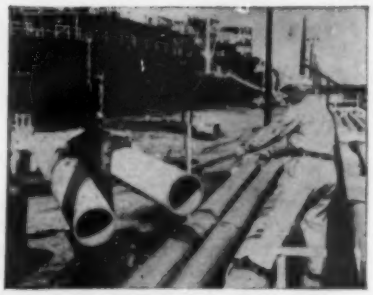
. . . that are time and pressure-controlled are described in new Series 60 bulletin. The intermitters and valves are described for gas-lift control, stop-cocking flowing wells, and regulating back pressure. The bulletin shows cutaway illustrations and gives detailed information on construction, use, and performance figures. **Write or call: Merla Tool Corp., P. O. Box 2576, Dallas, for Series 60 bulletins.**

Reducing valve

. . . for initial pressures to 300 psi. with gas, oil, or water is detailed in a new two-page bulletin. The valve, which is made of cast iron with bronze and steel trim, has a single-diaphragm, single-seat construction. The bulletin includes features, description, operating, and ordering information, valve drawing and photo, dimensions and parts list. **Write or call: Atlas Valve Co., 280 South Street, Newark, N. J., for Fig. 1910, Type E Reducing Valve bulletin.**

Engineering thought reevaluated

. . . on process-instrumentation system, as described in a new 12-page publication. It shows how both decision-making efficiency and quality of decisions might be improved. The brochure reexamines instrumentation systems from the standpoint of the operator's basic needs and compares them with the needs of those concerned with efficient and economic plant production. It points out that most instrument panels display more data than are required, not only increasing costs, but also complicating decision making and hampering effi-



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MINNEAPOLIS, Asbestos Products, Inc.
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GUSTIN gb BACON

They compared "K" factors and cost factors ...and bought SNAP*ON®

FOR FREE THERMO-ECONOMIC VALUE ANALYSIS OF YOUR PIPE INSULATION REQUIREMENTS, CALL YOUR LOCAL G-B SNAP*ON DISTRIBUTOR (LISTED IN ADJOINING COLUMN)

Compare handling costs, for example—and you, too, will find that Snap*On, the original one-piece pipe insulation molded of fine glass fibers, comes in featherweight 3′ and 6′ sections that make for easier and quicker handling and application. These lightweight sections can be tossed — even dropped — without breakage or damage, can be left in the open until weatherproofing jackets are applied.

You will also find that you can use Snap*On in thinner wall thicknesses than other insulations and still save more heat or cold . . . that Snap*On snaps on the pipe with amazing ease and economy . . . is permanent, yet reusable . . .is available in a complete range of copper tubing and iron pipe sizes to 36″, plain or jacketed, for hot or cold lines.

GUSTIN-BACON *Manufacturing Co* GUSTIN gb BACON

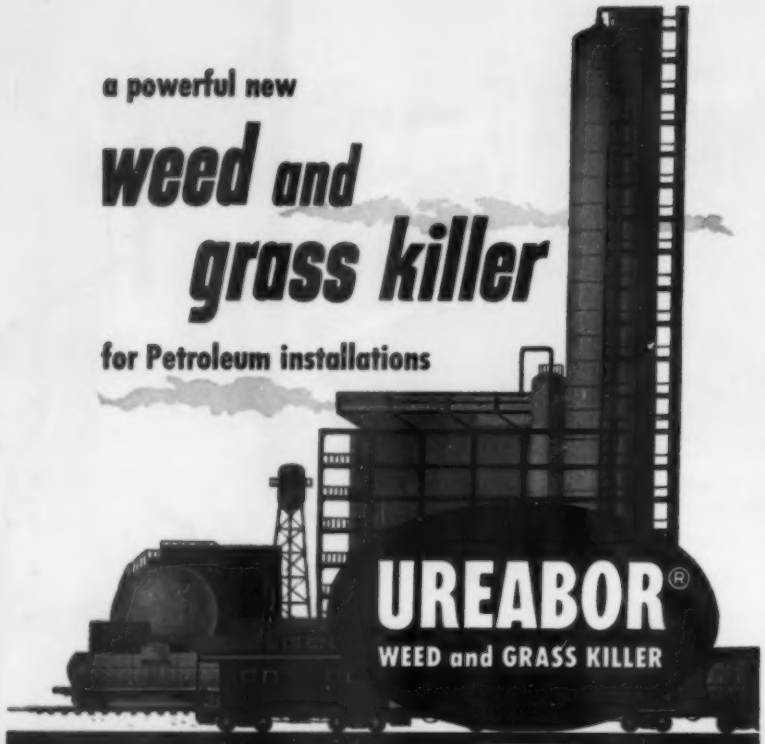
208 W. 10th St., Kansas City, Mo.

Thermal and accoustical glass fiber installations . . . molded glass fiber pipe insulation . . . Couplings and fittings for plain and grooved end pipe

a powerful new

weed and grass killer

for Petroleum installations



you get full season's control from one application!

PCB Spreader Makes Applying New Ureabor AS EASY AS WALKING!

A sturdy sling-strap unit made especially for fast, easy, accurate spreading of UREABOR at low rates. Holds enough UREABOR to treat 2500 sq. ft. at 1-pound rate. Simple action.

UREABOR offers you release from your weed problems—with new ease and big economy. Never before, a weed killer like this! Apply it DRY—at thrifty, low rates. No mixing—no water hauling—just apply UREABOR direct from sack to weeds. Nothing could be simpler, or safer, to use anywhere. UREABOR is nonflammable, noncorrosive, nonpoisonous when used as directed... and effective!

United States Borax & Chemical Corporation

PACIFIC COAST BORAX COMPANY DIVISION

629 SHATTO PLACE, LOS ANGELES 5, CALIFORNIA

cient plant operation. The brochure states the simplifications some engineers recommend and the reasons for them. It discusses advantages of graphic panels and considers the use of data loggers in a control room. Finally, the brochure points out advantages of Frieze panels and presents a seven-step guide to planning them. **Write or call: M. W. Kellogg Co., 711 Third Avenue, New York 17, for Kelloggram Issue No. 2.**

Thermowell-material guide

... for more than 325 different temperature-measuring applications is now obtainable. Guide was designed to aid thermowell users in selecting the proper thermowell material for a given application and operating condition. Applications are grouped in chart form according to industry. Recommendations include one or more materials for each application and take into consideration such factors as temperature, contamination, electroylsis, catalytic reaction, solution concentration, and other variables. The chart is printed on heavy stock and is suitable for wall mounting. **Write or call: Thermo Electric Co., Inc., Saddle Brook, N. J., for Thermowell Material Guide.**

Evolution of cleaning

... through technology is the topic of a new 24-page fiftieth-anniversary booklet published by a pioneer company which specializes in cleaning materials and methods. The booklet traces cleaning processes from the Neanderthal man through Roman methods of trampling clothes clean, through the Greek recipe for soap, to the present and even the future. **Write or call: Oakite Products, Inc., 159 Rector Street, New York City 6, for Oakite News Service; fiftieth anniversary issue.**

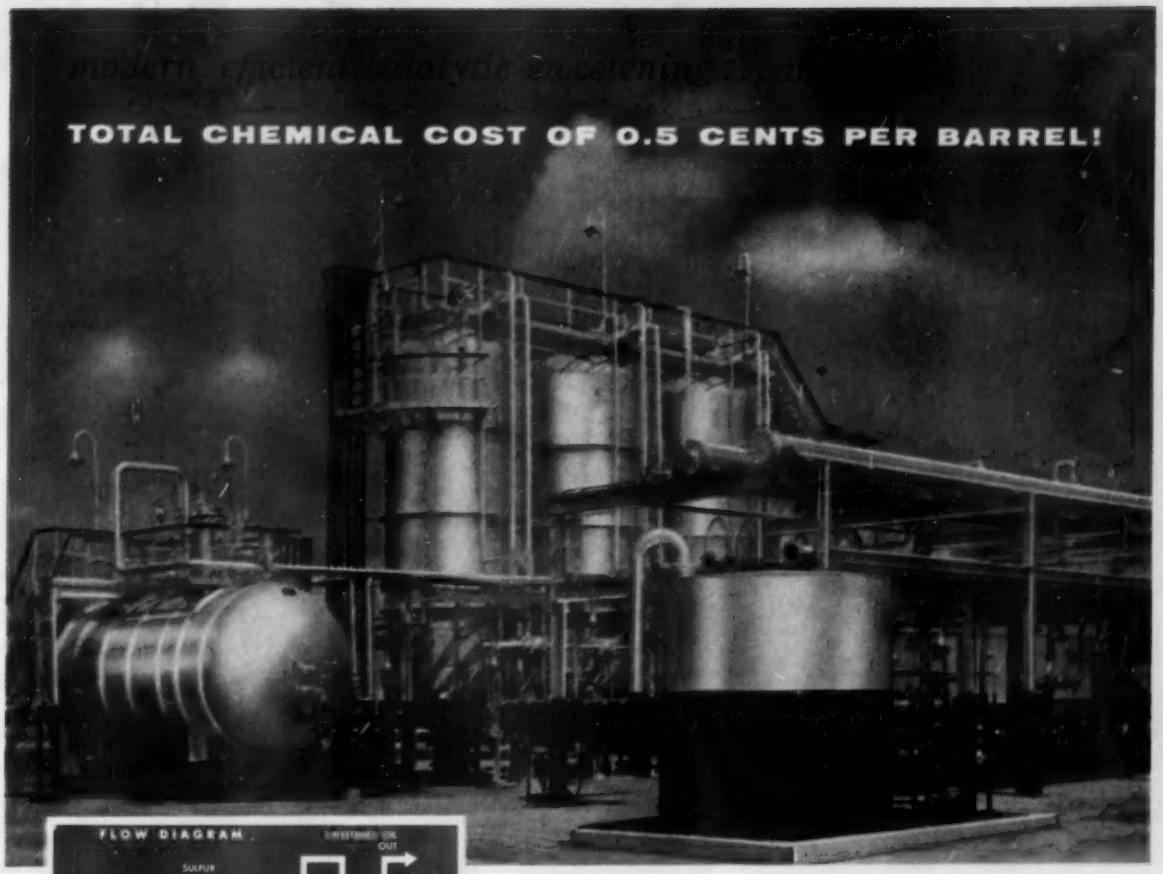
Pneumatic stroke controller

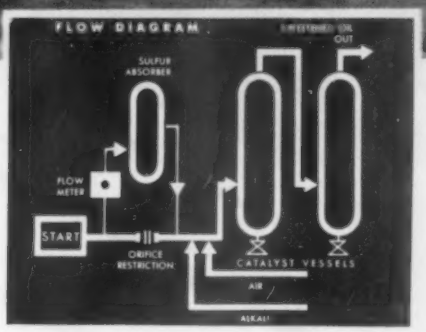
... is discussed in new two-page Bulletin 304. The controller operates in direct response to a 3 to 15-psig. air signal and requires no additional source of supply air. **Write or call: Hills-McCanna Co., 4608 West Touhy Avenue, Chicago, for Bulletin 304.**

Plant-modernization ideas

... are discussed in a new 20-page brochure now obtainable. The brochure presents 59 different modernization ideas and accompanies each with text and illustration. **Write or call: Allis-Chalmers Mfg. Co., P. O. Box 512, Milwaukee 1, Wis., for 59 Ideas for Modernization in '59 brochure.**

TOTAL CHEMICAL COST OF 0.5 CENTS PER BARREL!





PETRECO BENDER

catalytic sweetening process

It's true. The effective sweetening of distillates in the gasoline, kerosine, burning oil range can be accomplished the Petreco Bender way for about half a cent a barrel—for all chemical costs, including catalyst maintenance. (Installation cost also is low, ranging from $10 to $20 per barrel/day of throughput.)

Beyond these obvious cost advantages, the Petreco Bender process is simple to operate and maintain.

how Petreco Bender Catalytic Sweetening Works:

Controlled quantities of sulfur, alkali and air are added to the product stream. The resulting mixture is passed through a catalyst bed. The process sweetens by converting mercaptans to disulfides by oxidation—in an automatic, continuous operation.

THERE ARE OTHER ECONOMIES, TOO!

- Automatic control . . . minimal operating attention.
- Long catalyst life . . . simple on-the-site reactivation.
- No product loss.
- Freedom from copper contamination.
- Sweet, non-corrosive product.
- No stream or air pollution.

B-58-1R

PETROLITE CORPORATION

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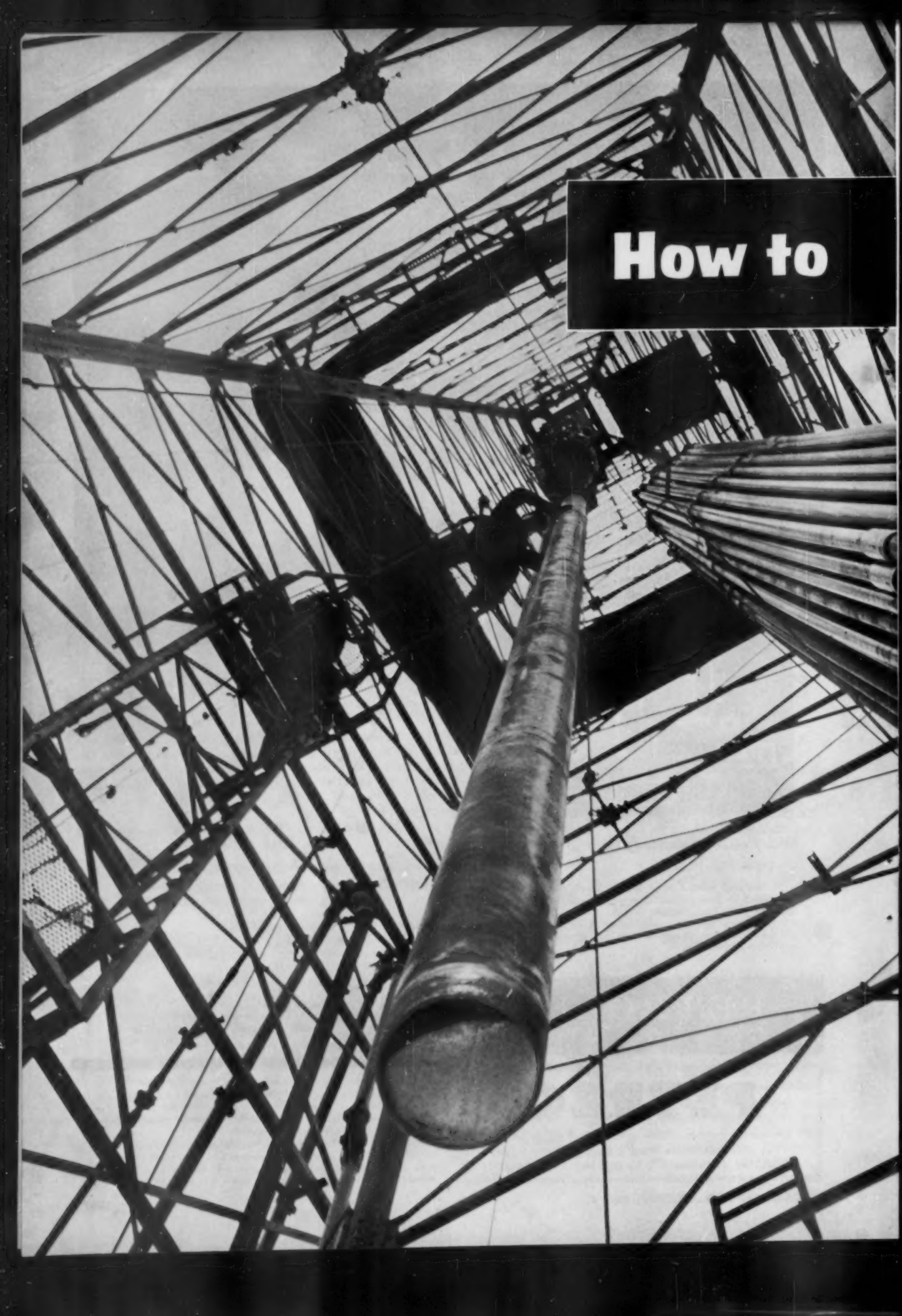
COLOMBIA: South American Petrolite Corporation, Calle 19, No. 7-30, Office 807, Bogota
ENGLAND: Petrolite Limited, 46 Mount Street, London, W. 1.
VENEZUELA: South American Petrolite Corporation, Hotel Avila, Caracas

REPRESENTATIVES:

BRAZIL: WERCO, Ltda., Rua General Gurjao 326, Rio de Janeiro
GERMANY: H. Costenoble, Guiollettstrasse 47, Frankfort, a.M.
ITALY: NYMCO, S.p.A. 9, Lungotevere A. da Brescia, Rome
JAPAN: Maruwa Bussan KK, No. 3, 2-Chrome, Kyobashi, Chuo-Ku, Tokyo
KUWAIT: F. N. Dahdah, Box 1713, Al Kuwait
MEXICO: R. E. Power, Sierra de Mijes, No. 125, Mexico, D. F.
NETHERLANDS: F. E. C. Jenkins, Hoefbladlaan 134, The Hague
PERU: International Gas Lift Company, Apartado 71, Talara
TRINIDAD: Neal and Massy, Ltd., Port of Spain, P.O. Box 544, San Fernando

PETRECO DIVISION
3202 South Wayside Drive (P.O. Box 2546), Houston 1, Texas
1390 East Burnett Street (P.O. Box 7216), Long Beach 7, California


How to

Buttress Long Strings

J&L Buttress Thread Casing has marked advantages in deep wells.

The couplings are longer. Pipe and couplings have longer, stronger threads. All threads engage fully . . . there are no vanishing threads as in conventional joints. These threads, five to the inch, Acme type, are angled to take tensional loads in sheer.

Inside clearance is not reduced (no internal upset). The pipe stabs easily and spins rapidly which means fast running time.

Buttress describes the product as well as the thread. The exceptional quality inherent in all J&L tubular goods is present in **J&L Buttress Thread Casing.**

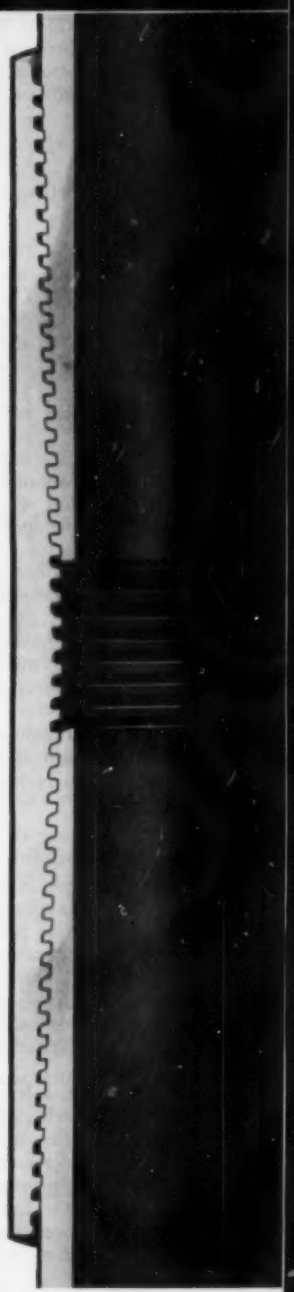
Quality control in the steel making and finishing processes is precise, exacting and continuous. Nothing is taken for granted. The highest-capacity in-line hydrostatic pressure tester in the world (up to 20,000 lbs. per square inch) checks **J&L Buttress Thread Casing.**

You can truly "Buttress" your long strings — and your production — with J&L casing.

Jones & Laughlin

SUPPLY DIVISION – Tulsa

If it's sold by J&L . . . .
It's the best available



Buttress Thread Joint

EQUIPMENT MEN

IN THE NEWS

Advertising groups merge

Brohard & Associates, Inc., Dallas advertising and public-relations agency, has merged with Ted Workman Advertising, Inc., of Dallas, announces Ted Workman, president.

M. M. Brohard, Jr., as a result, became vice president and account executive of Ted Workman Advertising, Inc. Brohard brought his accounts to the Workman shop and has assumed responsibility as account executive of several of Workman's present accounts. Brohard spent 20 years as sales and advertising manager for three eastern textile manufacturers before setting up his own agency in Dallas 2 years ago.

Edward W. Upton is named

Edward W. Upton

. . . executive vice president of Refinery Engineering Co. He joined the concern in March 1957 as executive assistant to the president, and was promoted to vice president, engineering, late the same year. For 6 years prior to joining the company, Upton was vice president and general manager of F. H. Maloney Co., Houston.

He previously had served 16 years with Byron Jackson Co., joining the firm in 1934 as a sales engineer in California. He moved to Chicago in 1937 as branch manager, and later the same year became Mid-Continent manager at Houston. In 1943, he was named regional manager in New York to handle eastern and foreign operations for Byron Jackson's Pump Division.

Jones & Laughlin makes

. . . four changes in its Supply Division's field-sales organization, reports W. L. Wolfe, vice president, sales.

L. E. Tucker, salesman, was transferred from El Dorado, Ark., to the New Orleans city sales office and C. S. Wood, salesman, was moved from Odessa, Tex., to the Dallas city sales office.

R. F. Bunce, salesman, was moved from Lafayette, La., to the Midland, Tex., sales office and P. C. Smith, assistant store manager at Morgan City, La., was promoted to salesman and transferred to Lafayette.

Tucker has been with J & L 9 years; Wood, 3; Bunce, 4; and Smith, 6 years.

NEW INDUSTRIAL-ENGINE PLANT of Caterpillar Tractor Co., is nearing completion at Mossville, Ill. It is being built on a 1,200-acre site and will add 470,800 sq. ft. under roof to Caterpillar's facilities for production of diesel engines. Another 88,000 sq. ft. of space is being planned for Engine Division offices. Production of these offices is expected to start this summer.

Robert L. Adair appointed

. . . sales manager of Corrosion Rectifying Co.'s Supply Division in Houston. He will be in charge of the division's sales in the Southern states.

Adair at one time was owner of Adair Wireline Service Co. More recently he was with Brance Krachy Co.'s cathodic-protection department.

Beacon Supply Co. promotes

. . . four, according to R. W. Sidwell, vice president.

G. W. (Bill) Taylor, former manager of stores, is the new vice president in charge of sales. H. C. Abernathy was appointed area manager in charge of the Tulsa and Dallas sales offices. He had been sales representative at Tulsa.

D. D. Shackelford, field salesman at Beacon's Farmington, N. M., store, was named sales representative at the Dallas office. O. E. Manes, former floorman at Farmington, was promoted to field salesman at the same store.

DESTINATION of these two Halliburton Oil Well Cementing Co. employes is pinpointed by Phil Orr. He and George Walker will leave for Adalaide, Australia soon to open Halliburton's "down-under" operations. Orr, who will head the venture, has been with the company for 10 years, working in Texas and Venezuela. Walker has been in Halliburton's export services for 5 years, and this will be his second assignment in Australia. Walker transferred to Welex, Inc., in 1958 and now will serve as an electrical service engineer. Halliburton is acting as Welex's overseas agent.

Sands G. Falk appointed

. . . eastern regional sales manager of Falk Corp., according to Thomas F. Scannell, vice president and general sales manager. Falk, a 20-year veteran of the corporation, had been marketing-research manager.

Don E. Dixon rejoins

D. E. Dixon

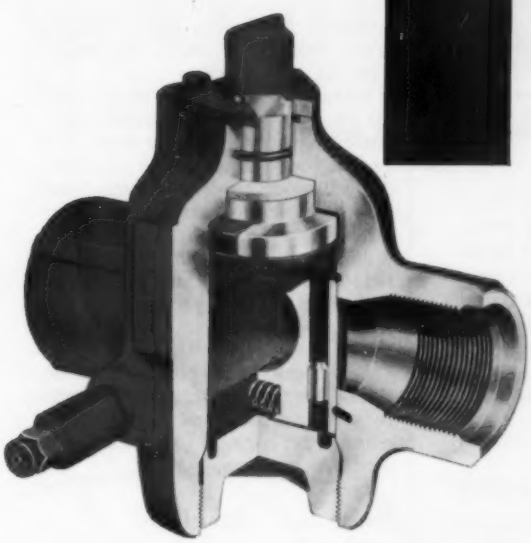
. . . Cooper-Bessemer Corp., announces Grant C. Woodard, general sales manager. Dixon is presently assigned to the company's turbo-compressor group, but is slated to join one of the regional field offices where he will have responsibility for application and sale of engines, and reciprocating and centrifugal compressors.

Dixon first started with Cooper-Bessemer in 1952 and later was promoted to manager of compressor-section sales. Finally he was named to the Tulsa office where he was directly responsible for field-contact work in the greater Oklahoma area.

Jumbo tank cars placed

. . . in service by Shippers' Car Line Division of ACF Industries, Inc. The two cars have capacities of 16,000 and 20,000 gal.

H. V. Bootes, Shippers' president, said the cars would be used on a trip basis to enable a variety of industrial users to judge them in service. The move is intended to capitalize



Cut-away Mission Valve

MISSION

the valve that thinks for itself!

Here's a valve that knows exactly what to do:
The higher the pressure, the more tightly the valve seals.
And it's as simple as this—line pressure forces
Mission Sealant through two semi-circular grooves around
the downstream port, sealing like a plastic packing,
to form a gas-tight seal. Leaks are stopped
automatically *before* they can start.

Two split cylindrical cores, acting like a gate,
are wedge-proof, allow easy opening and closing even
under pressure. Only the downstream core is pressed against
the body by line pressure. The upstream half is held
lightly in place by springs. Core friction is thus cut in half.

The complete line of 315 Mission Valves brings
these positive advantages of easy opening and
tight sealing to practically all valve applications.
This wide selection, the Mission Guarantee, and the
Mission Renewal Policy combine to make Mission Valves
your best and most economical buy.
Specify Mission and eliminate your valve problems.

MISSION MANUFACTURING CO.,
P. O. Box 4209, Houston, Texas
Cable Address—"Missco"
Export Office: 30 Rockefeller Plaza, New York
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17 Hanover Square, London W. 1 England
Cable Address—"Missoman"

Nothing but the finest will bear the name of MISSION MANUFACTURING CO.

Pistons • Piston Rods • Slips • Gland Packings • Liners • Liner Packing
Pump Valves and Seats • Swabs • Valves • Hammerdrils • Centrifugal Pumps

VAPOR PHASE® RECOVERS ENGINE HEAT; CUTS EXPENSES FOR TIDEWATER OIL CO.

Shell and tube heat exchanger; replaces cooling tower. Heat exchanger condenses steam, cools engines and transfers waste heat to power oil.

Conventional cooling tower (at right) eliminated by Vapor Phase® installation. Additional engines now installed in same space.

BEFORE VAPOR PHASE®

Fourteen 45 BHP gas engines drive power oil pumps at Tidewater's Lloyd Lease station. A large cooling tower cooled the engines, and gas-fired steam boilers heated the power oil. Because engine driven water pumps varied in flow, one or more engines received insufficient cooling water causing cracked heads and manifolds.

Each engine-triplex pump unit develops 3,000 psig to force heated power oil down well, lifting crude oil. Power oil must be heated to prevent parafine deposits on pipe walls and well tubing.

AFTER VAPOR PHASE® INSTALLATION

Now Engineering Control's exclusive Vapor Phase® system recovers engine heat, eliminating the large, expensive-to-maintain cooling tower. Recovered heat produces 1890 pounds of steam each hour to heat the power oil . . . eliminating the gas-fired steam boilers.

Cracked cylinder heads and manifolds have been eliminated, too, because Vapor Phase® equipped engines are cooled by **Thermal Circulation,** eliminating the water pumps and insuring a constant, uniform temperature throughout the engine.

Get Complete information . . . now . . . on how Vapor Phase® can save money for you.

Sole Developers and Manufacturers of Vapor Phase® Thermal Circulation (Ebullition) Engine Cooling Systems

ENGINEERING CONTROLS Incorporated

An Affiliate of St. Louis Shipbuilding & Steel Co.

611 E. Marceau, St. Louis 11, Mo.

1939 N. Hillhurst Ave., Los Angeles 27, Calif.

upon what Shippers' feels is an inevitable trend—the increasing adoption by railroads of lower freight rates for volume tank-car loads.

Tyson Smith Co. makes

. . . four new appointments, promotions and transfers in the sales and service department, announces Jack Norton, sales manager. The changes

J. H. Nichols

Oscar Johnson

involve J. H. Nichols, Oscar Johnson, W. F. Dillenback, and L. M. Bracewell, Jr.

Nichols, former sales engineer in the Houston area, was named assistant sales manager. He has more than 14 years' experience in the oil industry, having worked with Lane Wells Co. and Welex Jet Service before joining Tysco.

Johnson, a veteran of 40 years oilfield experience, was named manager of Tysco's service department. He formerly worked for Parkersberg Rig & Reel Co.

Dillenback was appointed sales engineer for Lafayette, La., and surrounding territory, and Bracewell was named sales engineer in the Lafayette-New Orleans area.

Nalco aids water-flood engineers

. . . of oil companies in the Los Angeles area at a seminar held recently at Long Beach. The session centered around corrosion and microbiological aspects of flooding, particularly dealing with bacterial problems where ocean water is used.

National Aluminum Corp. personnel participating were: L. L. Bott, petroleum chemicals product manager, Chicago; D. R. Behn, Southern California area manager; J. T. Nicholson, district manager; L. Wolfson, head of microbiology at Nalco's Chicago research laboratories; and D. C. Oleen, waterflood chemicals engineer, Chicago.

Homco purchases

. . . Associated Oil Field Rentals, it was announced jointly by Hugh Q. Buck, acting president of Houston Oil Field Material Co., Inc., and Harry J. Mosser, chairman of the board of

"Wherever oil men gather"

There's no way of getting around it . . . oil men move around a lot. Exploration, drilling and production activities might take them to any spot on the globe.

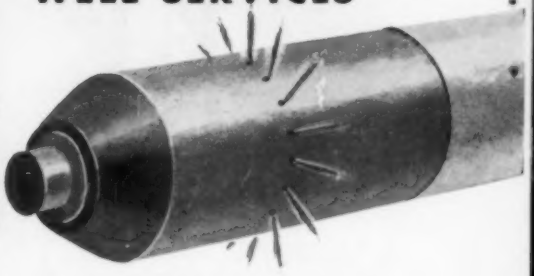
And when two or more oil men get together, the conversation sooner or later is sure to get around to financial matters. That's when, more and more, you hear the familiar phrase,

"For my oil loans, it's The Fort Worth National Bank."

THE FORT WORTH
National Bank
Helping Build a Greater Fort Worth and Southwest
MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION
CAPITAL AND RESERVE ACCOUNTS OVER $50 MILLION

HOMCO

ADDS THE HOMCO-McCULLOUGH CHEMICAL CUTTER TO ELECTRICAL WELL SERVICES

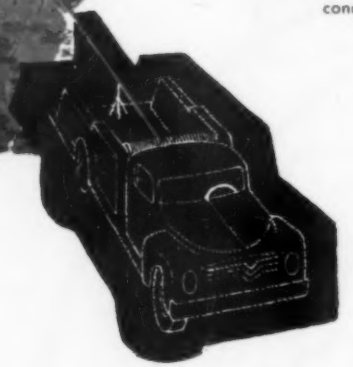


The *Homco-McCullough Chemical Cutter* was designed specifically for the purpose of cutting tubing quickly and efficiently. This cutter is run with the Homco Free Point Indicator or Homco Magnetic Collar Locator on a Homco electrical well service unit.

This tool applies the incendiary power and reactive force of elemental fluorine and the halogen fluorides under closely controlled conditions to "eat" through steel instantly. It produces a clean cut comprising a series of smooth burrles: concavities. This cut has none of the objectionable flaring produced by explosive methods.

ADVANTAGES:

1. Saves rig time.
2. Effective on tubing which can not be torqued due to packer mandrel turning or the condition of the pipe.
3. Can be run in conjunction with the Homco Free Point Indicator.
4. No flaring of tubing.
5. No damage to casing.



HOMCO

HOUSTON OIL FIELD MATERIAL COMPANY, Inc.

HOUSTON, TEXAS

THE WORLD'S LARGEST INDEPENDENT OILFIELD SUPPLY AND SERVICE ORGANIZATION
DIRECTIONAL DRILLING • FISHING AND CUTTING • OILFIELD SUPPLIES • ELECTRICAL WELL SERVICE

HOMCO ELECTRICAL WELL SERVICES

HOMCO EXPORT OFFICES

Houston, Texas (Headquarters)
New York, N.Y.
Mexico City, Mexico
Long Beach, California
Maracaibo, Venezuela
Paris, France

RESEARCH • ENGINEERING • DEVELOPING • MANUFACTURING

Associated Oil & Gas Co., of which the rental firm was a division. Purchase price was about $8 million.

C. H. Dresser, Jr. joins

... Milwhite Mud Sales Co. as city salesman in Houston. Before joining Milwhite, Dresser was with Cameron Oil Co. on the West Coast and with Pan American Oil Co.'s land departments in Oklahoma City and Houston.

Ray T. Rigney appointed

... field service manager of Lee C. Moore Corp. of Tulsa. Rigney, assistant plant superintendent for 8 years, will now direct all field service operations and personnel.

Oilwell makes two changes

Oliver E. Trechter, Jr., was named assistant district engineer at Jackson, Miss., and Wilburn D. Lakey was transferred to Brookhaven, Miss. The announcement came from M. F. Jones, Gulf Coast area manager of U. S. Steel's Oil Well Supply Division.

Trechter was employed by Oilwell in 1955 as assistant district engineer at Los Angeles. Later that year he was appointed district representative at Long Beach, Calif., and went back to Los Angeles in 1957.

Lakey will continue to serve as a field representative at Brookhaven. He had worked in the same capacity at Houston. Lakey joined the division 7 years ago at Beaumont, Tex., and was appointed field representative at Houston in 1955.

Kenneth M. Rice joins

... Tracy-Locke Co., Inc. as a specialist in oil-tool and industrial advertising. He was formerly advertising manager of Reed Roller Bit Co., Inc. Rice also had worked in the areas of field research and marketing analysis for four magazines and has sold oil tools throughout the United States and Canada.

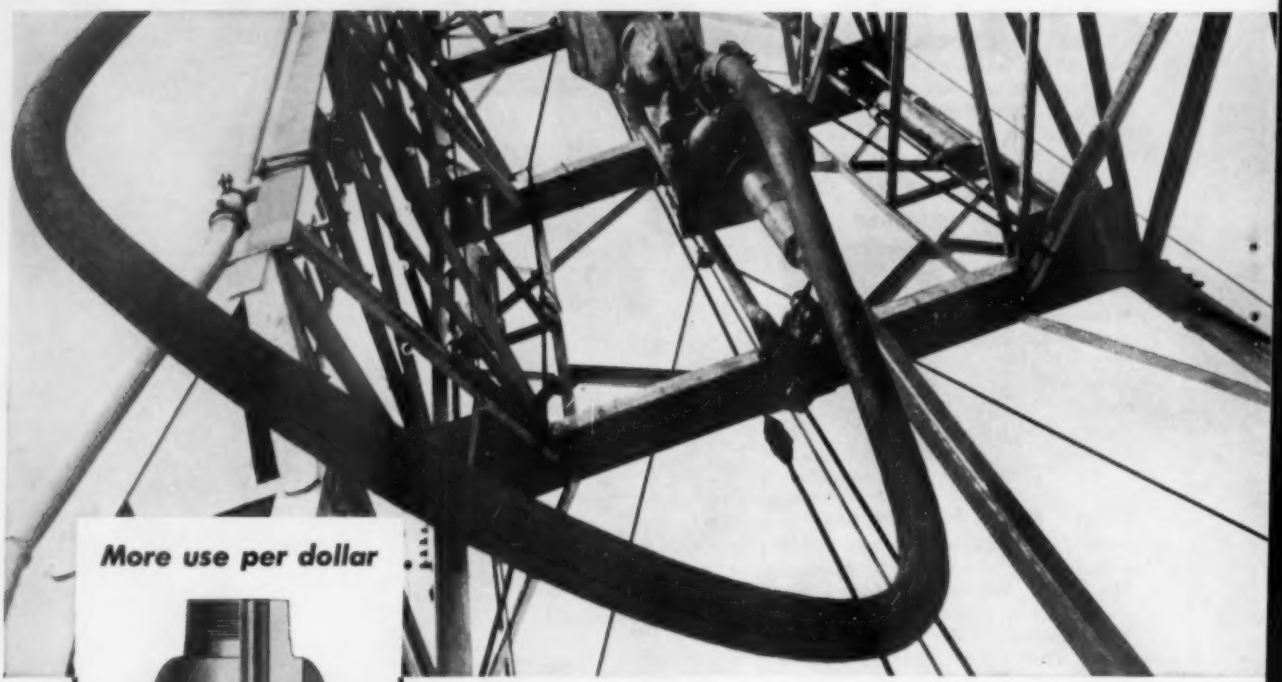
Cooling Tower Institute reports

... new officers. Ennis C. Smith of Hudson Engineering Corp. was elected secretary, filling the vacancy created by the resignation of Marley Co. from CTI. James P. Wiseman, of Fluor Products Co., was elected treasurer.

Karl E. Johnson, of J. F. Pritchard & Co., continues as president and

You can pump longer — and harder — with Flexite Plunger Rings. Flexite Rings are made of a tough, hard, fabric and phenolic resin compound and are precision ground for a "perfect circle" fit in the pump barrel. Flexite Rings won't corrode, swell, nor disintegrate—even in sour oil. A special step-cut design allows the rings to expand to a highly efficient seal on the upstroke, and fall freely on the downstroke. Flexite Plungers are also easy to make up in the field; no special tools, fixtures, nor instructions are required.
• If costly pulling jobs and pump repairs are cutting into your profits, use a Flexite Ring Plunger in the next pump you run. Your store or one of the many Harbison-Fischer representatives in all major pumping areas will be glad to give you an illustrated bulletin containing additional details, sizes, etc.; or write to P.O. Box 127 in Fort Worth. There's no obligation, of course.
if you want to do a real pumping job—run "FLEXITE" PLUNGER RINGS
Available for all A.P.I. Sub-Surface Pumps
Harbison-Fischer
"FLEXITE"
PLUNGER RINGS
HARBISON-FISCHER | FORT WORTH
"Best Pumps in the Oil Patch"

Wherever oil men work, they depend on



More use per dollar

Hose detail and coupling with Lip-Lok seal

RAY-MAN ROTARY HOSE

TROUBLE-PROOFS YOUR RIG

Special high-tensile steel cable wire reinforcement, precision wound under tension, makes Ray-Man CBL Rotary unequalled for strength, flexibility and safety. Because it is flexible without being bulky, Ray-Man CBL Rotary Hose is easier to handle and make up on the rig . . . resists kinking and accidental crushing in moving from location to location. Once you're rigged up, Ray-Man holds steadier in the derrick without whipping—even under the high pressures of deep drilling operations!

Ray-Man's streamlined, built-in coupling adds to the safety of using Ray-Man CBL Rotary Hose on your rig. It's specially designed without protruding lugs or flanges that cause fouling, and features R/M's leak-proof "Lip-Lok" seal that actually tightens under pressure to prevent dangerous—and costly blowouts! With Ray-Man's oil-proof tube for drilling-in with oil or oil-base mud, you've got the safest, easiest handling rotary hose for *all* methods of drilling.

For details of how you can get the longest, trouble-free service at the lowest cost per foot drilled . . . "More Use per Dollar" . . . write for Oilfield Hose Bulletin M651.

R M

OTHER RUBBER PRODUCTS FOR THE PETROLEUM INDUSTRY

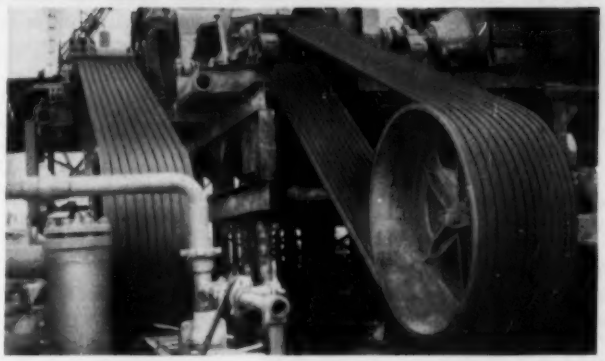
MUD PUMP INTAKE HOSE • VIBRATION HOSE • SHIP AND BARGE LOADING HOSE • TANK TRUCK AND TANK CAR HOSE • PROPANE HOSE • FUEL OIL TRUCK HOSE • FIRE HOSE

R/M Products

R/M POLY-V® DRIVES

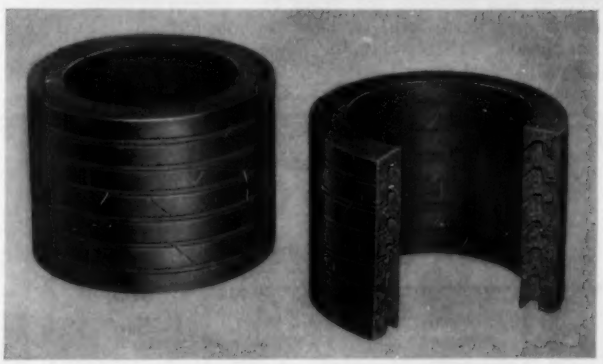
No other drive puts as much extra push in deep hole drilling as the exclusive, patented R/M Poly-V! Delivers up to 50% more power capacity than a V-drive of equal width . . . or equal power in as little as ⅓ the width. Single unit belt design eliminates belt matching problems in the field . . . reduces field inventories. Just *two* belt cross sections meet every heavy duty drive requirement. Write for Poly-V* Drive Bulletin M141.

**Poly-V is a registered Raybestos-Manhattan trademark.*



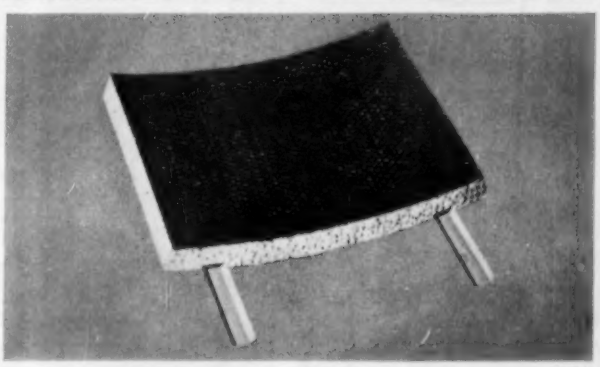
CONDOR LS V-BELTS

No whip, no wobble, no weave—no undue stress or V-belt turnover on long center, heavy duty oilfield drives! Condor LS V-Belts are *length stabilized* to give a degree of lateral and longitudinal stability *without stretch* never before possible. They're length *certified*, too . . . measured, tagged and vacuum packaged to assure positive length control and freshness from factory to field to drive. Write for Bulletin M210.



R/M VEE-SQUARE® PACKINGS FOR MUD PUMPS

Depend on R/M Vee-Square Packings for extra reliability. Nonyielding, they can take tight gland pressure, require no sensitive gland adjustments. Blow-by is prevented by soft rubber cushions between the rings, and they seal automatically. R/M "Vee-Square" packing is manufactured for all types and sizes of oilfield mud pumps. Write for Hydraulic Packings Booklet.



RAY-MAN BRAKE BLOCKS

Long lasting Ray-Man 635-D Brake Blocks cost less because they wear longer. Made of extra-large asbestos yarns, special saturant, wire reinforced. Resist bleeding, won't glaze or carbonize. Ray-Man blocks are available in drilled or countersunk sets or in the R/M patented Key-Lok style. Patented key-lok gives more friction surface, blocks slide on and off to speed relining. Make hole faster. Cut cost with Ray-Man. Call your nearest R/M warehouse today or contact your closest authorized R/M oilfield equipment supply store located in major oil producing areas.

RM928

RAYBESTOS-MANHATTAN, INC.

PASSAIC, NEW JERSEY

Brake Lining and Blocks • Clutch Facings and Automatic Transmission Friction Parts • Conveyor and Power Transmission Belts Industrial Hose • Rubber Covered and Lined Equipment • Mechanical Packings and Gasket Materials • Asbestos Textiles • Engineered Plastics • Sintered Metal Products • Abrasive and Diamond Wheels • Industrial Adhesives • Laundry Pads and Covers • Bowling Balls

Ernest E. Goitein, of Foster Wheeler Corp., as vice president of the national association of the major manufacturers of industrial water-cooling towers.

Palo Alto, Calif., headquarters and field-research programs continue under the direction of Raymond C. Kelly, executive manager. New field service-department offices under the management of James L. Willa have been set up in Houston.

Service Oil Tool Co. buys

S. H. Bowen's Division fishing-tool stores from Bowen Itco, Inc., of Houston. The announcement was made by T. M. (Tommy) Johnston, owner and president of Service Oil Tool.

Johnston, former executive vice president for Johnston Testers, Inc., of Houston and Los Angeles, plans to maintain the Bakersfield, Avenal, and Ventura, Calif., stores at their present locations and to move the Santa Fe Springs personnel and facilities to Long Beach, Calif., where the home office will be located.

Allis-Chalmers appoints

Harry L. Falck manager of petroleum and chemical sales of A-C's Los Angeles district, and assigns William G. Honsaker to the district as a sales representative. A-C also assigned Robert E. Claude to the New York district as a sales representative to the district's petroleum and chemical section.

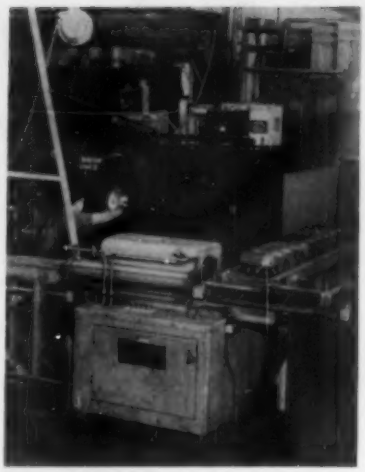
Falck had been a sales representative in the Los Angeles district since 1953. Honsaker recently completed A-C's engineer training course, and Claude joined the company in 1954 as an application engineer in the firm's compressor department.

W. T. (Tom) Pearson joins

Atlas Pipe, Inc., as a salesman in the Houston office. He had been district sales manager in Houston for Lone Star Steel Co. Pearson has held positions as purchasing agent and salesman with other Houston firms.

W. H. Seyffert, Jr. joins

Harold Brown Co. as South Texas division sales manager. He will headquarter at Corpus Christi, Tex., where he formerly owned Technical Services Co., before starting with Harold Brown.



HARD-FACING via production line was developed by National Supply Co. for tool joints used in drill strings. After passing through the induction heater on a conveyor, tool joints are positioned by one of two operators for either of two identical automatic hard-facing operations. Production problems were solved by this automatic, gas-shielded, surface-melting arc and a metered flow of tungsten carbide particles into the molten pool behind the arc on the rotating tool joint. A nonconsumable electrode melts the surface of the tool joint to a depth of about ⅛ in.

We'll save $1,600.00 on this workover by using
OTIS TUBING SERVICE
...here's how!
WE'VE GOT A 6,000-FOOT DUAL-PRODUCER HERE THAT IS EITHER LEAKING AROUND THE PACKER OR HAS A HOLE IN THE TUBING. AT LEAST SOMETHING WENT WRONG BECAUSE WE HAD A SUDDEN PRESSURE DROP ON THE LOWER ZONE AND AN INCREASE IN PRESSURE ON THE UPPER ZONE. IN EITHER EVENT, WE'RE GOING TO HAVE TO PULL THE TUBING.
First in Press
OTIS' CHARGES TO ROUND-TRIP THE TUBING UNDER PRESSURE WILL FIGURE ABOUT $2,800.00—EXCLUDING RIG COSTS.
6...12 hour days
or 72 hours as follows:
The first 40 hours...$1600.00
32 hours at 30.00 an hour 960.00
Mileage charges are
80 miles at 75¢ per mile...60.00
Wire line work to plug
tubing and remove plug...170.00
$2,790.00

McCullough Tool Co. shifts

. . . personnel, announces O. J. McCullough, vice president. W. H. Harvey, a 12-year company member, was promoted to district sales and service manager of the Victoria, Tex., district. He was formerly an area salesman located in Dallas.

David M. Glass was transferred from Luling, Tex., to Victoria as district sales representative. A. D. Wilson is now at Breckenridge, Tex., as district sales representative, and Charles A. Marion is at Luling as Southwest area salesman. Bill Rimes was appointed district sales representative at New Iberia, La.

Recently promoted to district sales representatives were Jack N. Lawson, Salem, Ill., Benjamin A. Newton, Hays, Kans., and Robert W. Sullivan, Olney, Ill., all of whom were service unit operators in their respective districts.

Dowell shifts personnel

. . . in Rocky Mountain area. M. E. (Cotton) Heslep was transferred from Williston to Riverton, Wyo., where he will handle sales work; V. D. Warnke was moved to Worland, Wyo., where he will be service engineer; and G. A. Berry was shifted from Worland to Williston, where he will replace Warnke as service engineer.

Heslep has been with Dowell division of The Dow Chemical Co. since 1942. His first assignment was at Borger, Tex., after which he served at Nocona and Graham, Tex. He later moved to Kansas, where he was stationed until 1954. Since that time, he has been at Williston.

Warnke joined Dowell 7 years ago at Williston, and has been located there and at Tioga, Wyo., since. He was promoted to field engineer in 1956, and a year later became service engineer.

Berry started with Dowell in 1955 as a junior service engineer at Worland. Later that year he became a field engineer, and in 1956 was made service engineer.

T. J. (Ted) Bicknell named

. . . district manager of Western Co.'s new service point at Seminole, Okla.

An 11-year veteran with Western, Bicknell has seen service at Guymon, Okla., Ulysses, Kans., Borger, Tex., in the company's Oklahoma City division, and in the Midland division at Odessa, Rankin, and Seagraves, Tex. Bicknell has served Western as treating engineer, field engineer, field supervisor, and operations supervisor.

J&L opens sales office

. . . in Los Angeles, and names R. A. Mercer city sales manager, according to W. L. Wolfe, vice president, sales, of Jones & Laughlin Supply Division.

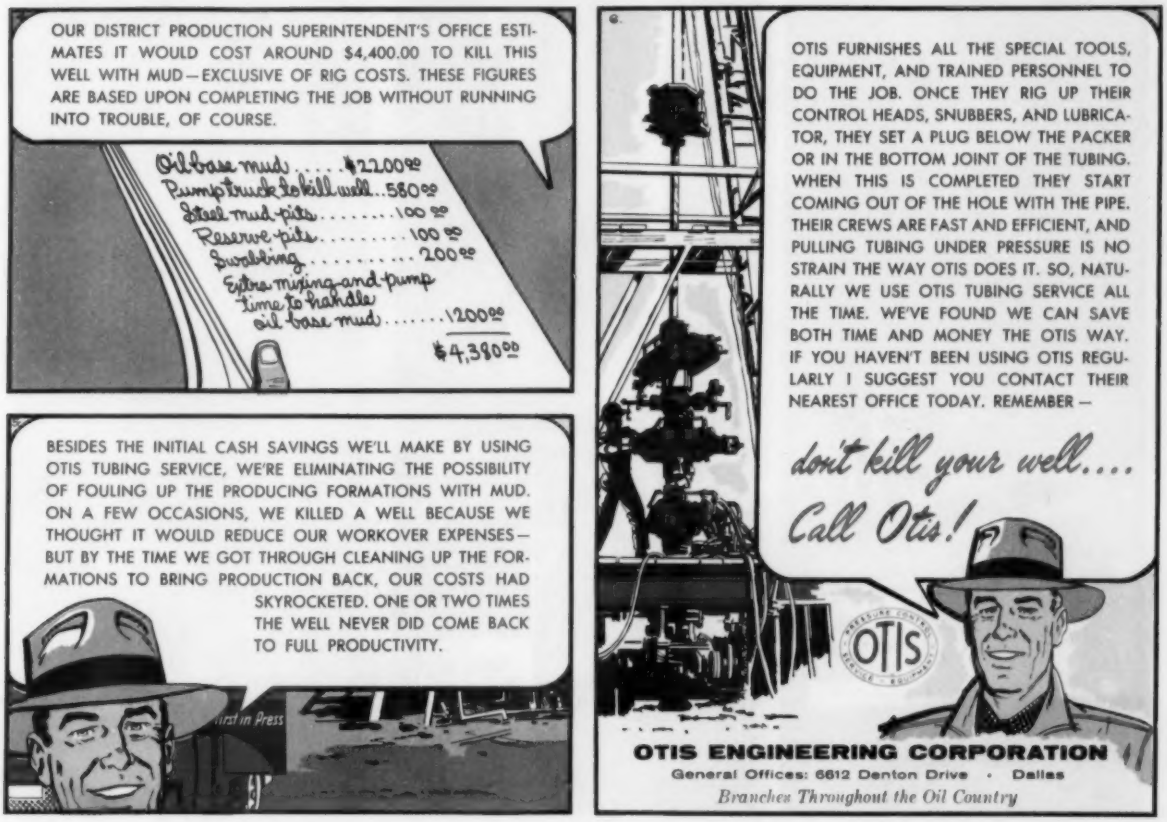
Mercer started with J&L at Bushton, Kans., 8 years ago. He was promoted to salesman in 1952 and later was transferred in that capacity to Hill City, Kans.; Williston, N. D.; Billings, Mont.; and Wichita, Kans. He was appointed city sales manager at Cleveland, Ohio, in 1957, where he served prior to his new assignment.

Sperry-Sun announces three

. . . personnel changes. Henry Grady Bell was promoted to district manager of the New Orleans office, where he has been a district representative since 1956. Before that, Bell was district representative of the Lafayette office, and salesman at the Marshall, Tex., office of Sperry-Sun Well Surveying Co.

John William Wilson was appointed district representative at Odessa, Tex. He formerly was a salesman for the New Orleans office.

Wilburn Remy Angelle, Jr., was made district manager of the Lafayette office, where he had previously served as district representative and salesman.


OUR DISTRICT PRODUCTION SUPERINTENDENT'S OFFICE ESTIMATES IT WOULD COST AROUND $4,400.00 TO KILL THIS WELL WITH MUD—EXCLUSIVE OF RIG COSTS. THESE FIGURES ARE BASED UPON COMPLETING THE JOB WITHOUT RUNNING INTO TROUBLE, OF COURSE.
Oil base mud $2200.00
Pump truck to kill well .. 580.00
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Extra mixing and pump time to handle oil base mud 1200.00
$4,380.00
BESIDES THE INITIAL CASH SAVINGS WE'LL MAKE BY USING OTIS TUBING SERVICE, WE'RE ELIMINATING THE POSSIBILITY OF FOULING UP THE PRODUCING FORMATIONS WITH MUD. ON A FEW OCCASIONS, WE KILLED A WELL BECAUSE WE THOUGHT IT WOULD REDUCE OUR WORKOVER EXPENSES—BUT BY THE TIME WE GOT THROUGH CLEANING UP THE FORMATIONS TO BRING PRODUCTION BACK, OUR COSTS HAD SKYROCKETED. ONE OR TWO TIMES THE WELL NEVER DID COME BACK TO FULL PRODUCTIVITY.
First in Press
OTIS FURNISHES ALL THE SPECIAL TOOLS, EQUIPMENT, AND TRAINED PERSONNEL TO DO THE JOB. ONCE THEY RIG UP THEIR CONTROL HEADS, SNUBBERS, AND LUBRICATOR, THEY SET A PLUG BELOW THE PACKER OR IN THE BOTTOM JOINT OF THE TUBING. WHEN THIS IS COMPLETED THEY START COMING OUT OF THE HOLE WITH THE PIPE. THEIR CREWS ARE FAST AND EFFICIENT, AND PULLING TUBING UNDER PRESSURE IS NO STRAIN THE WAY OTIS DOES IT. SO, NATURALLY WE USE OTIS TUBING SERVICE ALL THE TIME. WE'VE FOUND WE CAN SAVE BOTH TIME AND MONEY THE OTIS WAY. IF YOU HAVEN'T BEEN USING OTIS REGULARLY I SUGGEST YOU CONTACT THEIR NEAREST OFFICE TODAY. REMEMBER—
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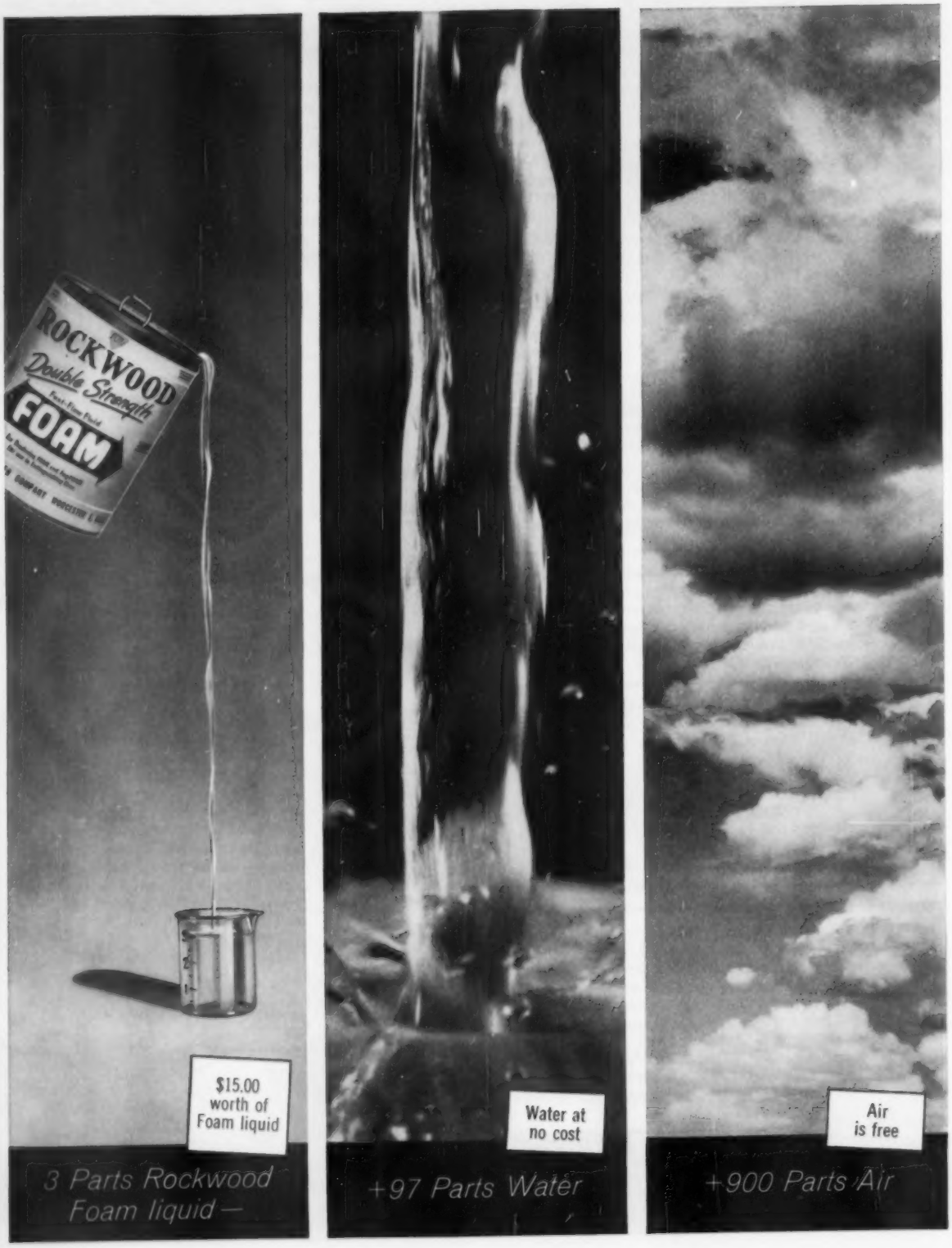

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bridging fiber

combats tough cases

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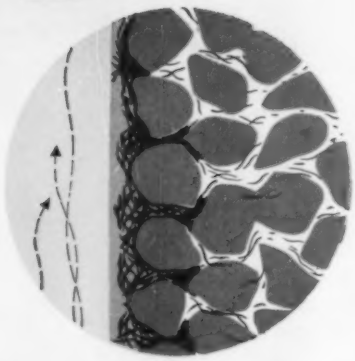

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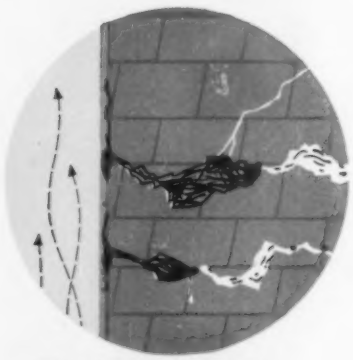
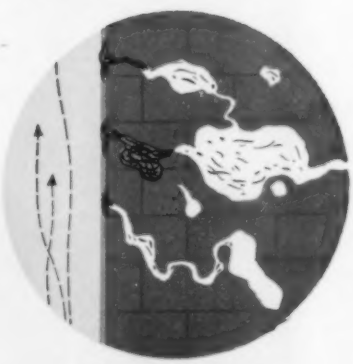
PLUG-GIT ... easy to handle, easy to mix, economical

Specify **PLUG-GIT** and see for yourself why it wins immediate approval of drillers and engineers for combating lost circulation.



FRACTURES OR FISSURES



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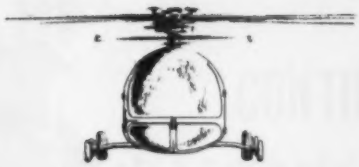

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Steel Fabrication
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J. Gregory Tierney is named

. . . sales representative in the Indiana, Southern Illinois, and Western Kentucky territory for Leschen Wire Rope Division, H. K. Porter Co., Inc., reports Gordon N. Dow, general sales manager.

Tierney had been with the City Engineers Department of Indianapolis as superintendent of maintenance for the Board of Flood-Control Commissioners and has a background in heavy-construction equipment.

Armstrong Cork transfers two

John B. Helmer, of the Cleveland district office of Armstrong Cork Co.'s Industrial Division, has transferred to the Los Angeles district office. He joined the division in 1956.

Wayne W. Downs was moved from the Lancaster, Pa., general office, where he had served as a technical assistant in textiles, to the Greenville, S. C., district office as a salesman. Downs was assigned to Lancaster in 1957.

National Tube appoints

. . . five men to new posts, according to Robert E. Williams, general sales manager of National Tube Div. of U. S. Steel Corp.

James P. Bacon was named manager, Tubing Specialities. He was formerly sales manager of that department. James H. Degnan, claims manager, was appointed manager of Oil-Country Tubular Products.

George O. Nations, former assistant general sales manager, is the new manager of Standard Pipe Products. Rene A. Taylor takes over as claims manager. He had been district representative in the Atlanta sales office for Tubing Specialities. New manager of administrative services is Joseph B. Willmering, who had been assistant to the general sales manager.

Onan unveils 21 new models

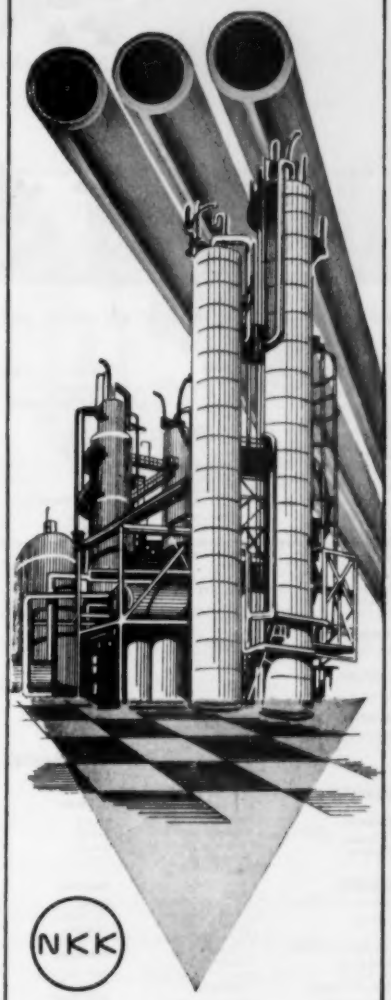
. . . of electric generating plants at the company's first international distributors sales conference. Many of the plants are designed to provide increased power to meet higher operational demands of new and improved basic equipment and supplies.

The new models, both gasoline and diesel-driven, produce from 1 to 200 kw. each, providing a greater choice of standby power than had previously been available in any D. W. Onan & Sons, Inc.'s generators. The largest new gasoline units will now provide 150 kw., double the previous peak-power available.

The largest new diesel unit, producing 200 kw., is 40 times larger than any other diesel model previously available from the company.

Pipe & Tube

For Oil & Gas Industries



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ALBERTA
Calgary
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Red Deer

BRITISH COLUMBIA
Fort St. John

MANITOBA
Virden

SASKATCHEWAN
Estevan

DOMESTIC

ARKANSAS
El Dorado
Magnolia

CALIFORNIA
COASTAL REGION
Ventura

LOS ANGELES BASIN
Long Beach
Los Angeles
Santa Fe Springs

SAN JOAQUIN VALLEY
Bakersfield
Coalinga
Taft

KANSAS
El Dorado
Elbinwood
Great Bend*
Liberal
Pratt
Russell
Wichita*

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NORTH LOUISIANA
Jena
Shreveport

SOUTH LOUISIANA
Eunice
Harvey
Houma
Lafayette*
Lake Charles
Morgan City
Morgan City Parts Depot
New Iberia
New Orleans*
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TEXAS
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NORTH and WEST CENTRAL TEXAS
Abilene
Dallas*
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Graham
Nocona
Wichita Falls

SOUTH TEXAS
Alice
Freer
Luling
McAllen
San Antonio*

SOUTHWEST TEXAS
San Angelo

TEXAS GULF COAST
Corpus Christi
Daisetta
El Campo
Falfurrias
Houston
Victoria

TEXAS PANHANDLE
Amarillo
Borger
Pampa

WEST TEXAS
Andrews
Hadacol Corners
Kermit
Lubbock
McCamey
Midland*
Monahans
Odessa
Post
Snyder
Sundown

Rocky Mountain States

COLORADO
Artesia
Denver
Rangely
Sterling

MONTANA
Billings*
Cut Bank
Glendive

NEBRASKA
Kimball

NEW MEXICO
Farmington
Hobbs
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NORTH DAKOTA
Williston

WYOMING
Casper
Cody
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Salem

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New Harmony

KENTUCKY
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when you standardize on Yellow Strand POWERSTEEL, you are sure of an adequate supply throughout the Drilling World . . through your Continental-Emsco store or representative.

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New Bedford Manila is treated to resist water and oil absorption, rot and mildew. Lubrication reduces internal friction and gives longer useful service.

Go First Class

at no extra cost . . outfit your rig with New Bedford Manila rope . . the finest in the oilfields . . from Continental-Emsco.

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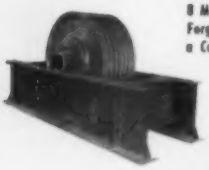
Don't take hoisting and rotating equipment for granted. We don't at Continental-Emsco. From crown block to rotary, each item meets C-E's high standards of design, engineering, manufacturing, inspection and service. This assures peak performance and long life. All Continental-Emsco equipment is backed up with *experienced* field service and availability of parts throughout Continental-Emsco's *worldwide* sales and service organization.

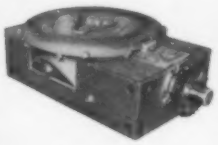
CROWN BLOCKS
8 Models up to 600 Tons Capacity
Forged Steel Rim Sheaves . .
a Continental-Emsco Original



TRAVELING BLOCKS
14 Models up to 600 Tons Capacity
Continental-Emsco Originated
Forged Steel Rim Sheaves

HOOK BLOCKS
8 Models up to 350 Tons Capacity
Continental-Emsco Blocks combined
with Web Wilson Hook

ROTARY TABLES
6 Models up to 27½"



SWIVELS
4 Models up to 400 Tons Capacity
One-Piece Cartridge-Type Washpipe
Packing

gives you engineering superiority . . field proven dependability . . worldwide service

Continental-Emsco can equip any rig with blocks, swivels and rotary machines designed, engineered and field proven for top rig efficiency and faster, trouble free drilling operation.

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Green Triangle FLEXIBLE HOSE UNITS

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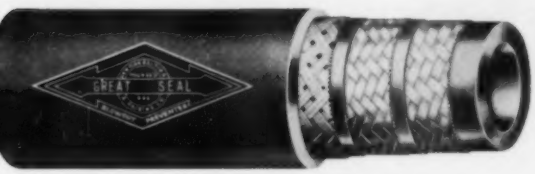
These high-quality hose units . . manufactured by New York Belting and Packing Company . . are reinforced against hard rig usage and are quickly connected and disconnected for time-saving moves.

GREEN TRIANGLE ROTARY HOSE
. . the industry's finest . . scientifically embedded reinforcing wires greatly extend hose life . . flexible . . high resistance to kinking. Conforms with or exceeds API standards.



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. . super safe . . flexible water hose for shale shakers . . wash-down hose . . mud-system connections.

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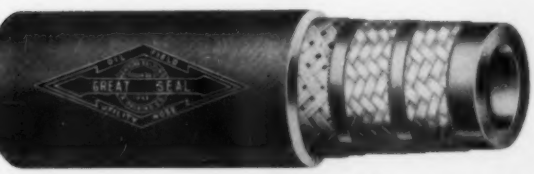
with built-in couplings . . pipe breakage greatly reduced by vibration-absorption qualities . . connections stay tight.



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Equip your rig with this dependable line of hose . . always available through your Continental-Emsco store or representative.

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A reduction in solids of 19.25 lbs. per bbl. can be obtained in mud with an apparent viscosity of 16 centipoises by using ¾ lb. of High-Viscosity Pure DRISCOSE and 5 lbs. of bentonite per bbl. of water. Normally, mud of this viscosity requires approximately 25 lbs. of bentonite per bbl. of water.

Technical data and literature . . . assistance on formulating low solids muds available upon request.

Four grades of DRISCOSE are available from your mud dealer: High Viscosity, Medium Viscosity, 70S High (all 99+% pure CMC) . . . and Technical Grade (72% CMC) of different viscosities.

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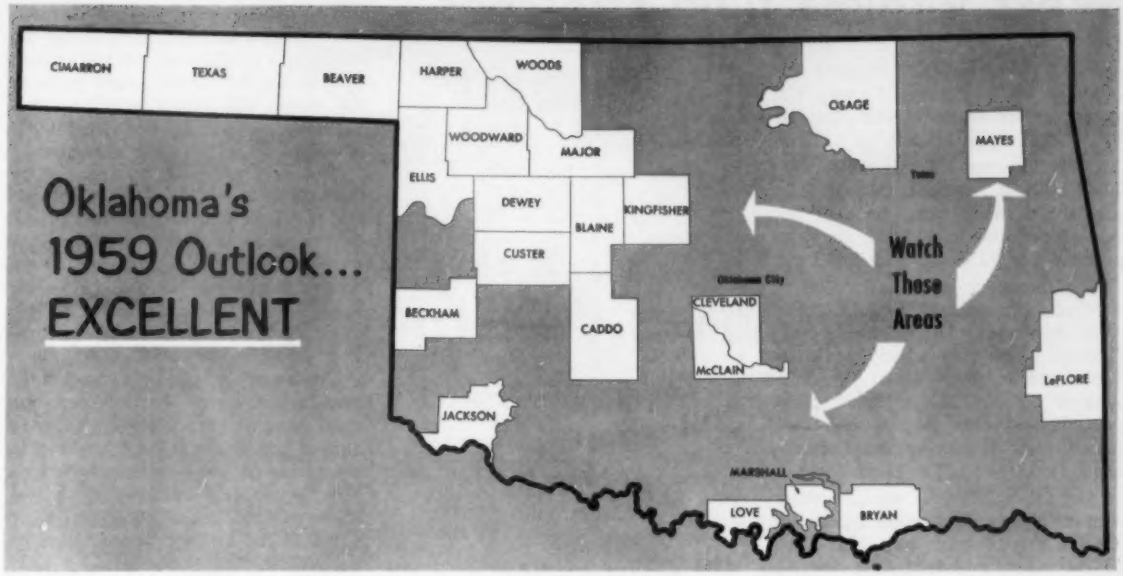

Try Oklahoma for size in '59

BY JOHN C. McCASLIN

IF YOU ARE looking for wildcatting territory with a real challenge in 1959, come to Oklahoma. Here is one of the nation's most varied and successful wildcat provinces. Take a look at last year's exploratory record in the Sooner State. Of the 854 wildcats put down in the state's 77 counties, 16.5% were oil discoveries, 4.7% opened new gas fields, adding up to an impressive 21.2% success ratio. Taking the state area by area, you come up with even higher success ratios in some regions . . . 50% plus in the Panhandle, one out of three in the northwestern counties.

A reason . . . Many factors contributed to the increase in successful wildcatting in Oklahoma.

- More exacting subsurface work located better wildcat sites.
- Increased drilling into the thick and prolific Ordovician sands in the southern counties bore more new pools than in previous years.
- The most important factor, however, was bold exploration . . . moving into areas of the northwest where little or no production existed 2 years ago . . . returning to older producing areas with new techniques and ideas . . . and following up discoveries with brisk development programs.

For continued growth . . . Based on the spirited exploratory year just past, the outlook for wildcatting in Oklahoma in 1959 is perhaps the best in the past 5 years. The state will be right in there with other bright provinces such as Wyoming, Montana, Four Corners, and western Canada. A look at the accompanying map gives a quick rundown of counties to keep an eye on. Notice that the trend is to the west and northwest as has been the case for the past 3 years. But note also that the Texhoma Lake counties and south-central counties are expecting big things. An old-timer, Osage County, having finished one of its best years of many, will plunge right back into the thick of it. There may be some news from the mountain counties in the southeast and from the shallow rocks of northeastern Oklahoma also.

On all fronts . . . Pinning the new year's exploratory trends in Oklahoma down to specific locales, we find that last year's discovery areas will be the centers of interest. But there will be new frontiers opened in 1959 along with this development.

. . . Northwest. The old push into deeper rocks of the Oklahoma Panhandle shows no signs of letting up. This region's new frontier is far western Cimarron County. The other northwestern counties will move out of the youthful stage this year. Look for first oil in Custer and Roger Mills counties this year, plus growth of production in Dewey, Blaine, and Kingfisher counties.

. . . West. Elk City field, site of the world's second-deepest hole, will head interest here. Logs indicate several pay prospects up the hole at Shell's 24,000-ft. Rumberger well.

A new province is shaping up in western Jackson County where the Palo Duro basin slips into Oklahoma. Harmon County may join the producing ranks.

. . . South. This is the area where flush oil discoveries will keep the map makers busy. Red River Valley counties will star in this play. Farther north, McClain and Cleveland counties, after several years of high success, will forge ahead even more. There appears to be no end to the big oil pools awaiting the drill in this section.

. . . East. The state's oldest producing counties don't seem to give up. Development will be brisk in Osage and Creek counties.

So if you are looking for oil or gas, whether it be in shallow areas or in ultradeep Ordovician sections, and if you like to venture into one of the country's most diversified geologic provinces, bring your rig to Oklahoma.

West Virginia field stretches

GLADY FIELD in West Virginia was extended by Columbian Carbon Co. at the United States of America E-1 Pocahontas 4, GW-1220.

Open-flow test of this well made 7,043 M.c.f.d., natural, through 7-in. production string from the Oriskany sand. Total depth is 5,830 ft. Rock pressure for 72 hours was 1,402 psi.

The discovery is located 6,200 ft. west of Longitude 79° 45', 5,200 ft. south of Latitude 38° 40', Pocahontas County, Durbin Quadrangle, Greenbank District. It is 9,550 ft. southwest of the Gw1201, U.S.A. 1-2 Pocahontas 11 well which was completed after fracturing the Oriskany sand flowing 17,250 M.c.f.d.

The GW-1220 well moves production southwest to a point where the field is now 15 miles long. This is one of the most important field developments in West Virginia in some time. No dry holes have been drilled in the field.

WEST VIRGINIA'S Glady gas field was extended 2 miles, making it 15 miles long. The extension well is Columbian Carbon Co. U.S.A. E-1 Pocahontas 4, GM-1220.

Alberta drilling could be significant

DRILLING ACTIVITY in Alberta during the first month of the new year is certainly not at a record rate, but the outcome of the action could be the most interesting in many years.

Actually, there are 167 drilling rigs now at work in the Province, the best rate since February and March of last year, when there were 182 working, and only 2 below the rig activity during the month of January 1958.

While the current rate cannot claim the activity record, the concentration of large rigs in one particular region—Swan Hills-Kaybob-Simonette-Berland River—certainly must. All of those tests command rigs of the 8,000-14,000-ft. range and when you consider that there are 55 active in that district, a whale of a lot of hole is scheduled to be drilled. Drilling contractors have an investment of about $13,000,000 in equipment. Each of the units costs in the neighborhood of $250,000.

That investment, however, is more tangible than that put forth for the drilling of the wells. Of the 55 rigs currently in this region, 30 are on what can be considered wildcat tests with the remainder on field-development drilling. A rough estimate of the footage to be drilled by the 30 rigs on wildcat locations runs in the neighborhood of 303,500 ft. The 25 rigs on development work, meanwhile, will compile a total of 228,000 ft. When you consider that it costs about $18 a foot for development wells in the region and $13 a foot for wildcat tests, something like $8,000,000 is due to be spent in the program.

The area covered particularly by this survey covers a 100-mile-wide and 120-mile-long section of central-west Alberta, starting 50 miles northwest of Edmonton, running up to the bottom of Lesser Slave Lake to the north and over to the west as far as the sixth Meridian, 75 miles southwest of Peace River townsite.

Contained in that district, however, are some of the province's recently discovered accumulations of oil and/or gas. Swan Hills, discovered in the spring of 1957 by Home Oil Co., Ltd., started the ball rolling, it was followed by Phillips Petroleum Co.'s strike in the Kaybob region, then by the British American Oil Co., Ltd.-Shell Oil Co. of Canada, Ltd. gas strike at Berland River, and then by Shell's more recent oil discovery in the Simonette River region.

Work currently being done in the area can almost be divided into two separate developments. One sector is being explored and developed with the Beaverhill Lake-Slave Point formation as its prime objective; while the other is being drilled in efforts to find and develop further oil and gas reserves in the D3 reef horizon.

However, a great number of the exploratory tests in both regions are scheduled as "basement tests."

Canada field has new pay zone

BEATTON RIVER, British Columbia's most successful oil pool, has a new pay zone, the Bluesky. Triad Oil and Associates found oil in a 19-ft.

December condensate, service-well depth breakdown

	FIELD CONDENSATE						WILDCAT COND.					SERVICE WELLS					
	D	E	F	G	H	I	E	F	G	H	I	A	B	C	D	E	F
Colorado	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Kansas	1	2	..	..	..	..	..	..	..	..	..	..	..	5	3	..	..
Louisiana	..	..	6	7	4	5	..	1	2	1	1	..	..	2	..	..	..
Mississippi	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
New Mexico	..	2	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Oklahoma	1	2	..	..	1	..	..	1	..	..	..	1	13	5	..	..	..
Texas	5	19	19	15	2	..	2	4	3	..	..	5	7	26	..	..	1
Arkansas	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..
California	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	1	..
Illinois	..	..	..	..	..	..	..	..	..	..	..	7	21	13	..	..	..
New York	..	..	..	..	..	..	..	..	..	..	..	..	20	..	..	..	..
Ohio	..	..	..	..	..	..	..	..	..	..	..	..	2	3	..	..	..
Pennsylvania	..	..	..	..	..	..	..	..	..	..	..	2	9	..	..	..	..
West Virginia	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..
Total U. S.	7	26	26	22	7	5	3	7	5	1	1	18	76	54	3	1	1

ALASKA ...in case you are interested

- *has an area of 586,400 square miles*
- *has at least nine possible petroleum provinces*
- *has the highest peak in North America (Mt. McKinley, 20,257')*
- *was discovered by a Dane, Vitus Bering, in 1741*
- *has a 6,640-mile coastline*
- *has, as its approximate geographic center, a point in latitude 63° 46', longitude 152° 20'*
- *has produced some oil since the early 1900's*
- *has, as its state flower, the Forget-me-not,*

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December completion tally

	TOTAL COMPLETIONS							WILDCAT WELLS							
	Total	Crude	Cond.	Gas	Dry	Service	Footage	Total	Crude	Cond.	Gas	Dry	Footage	C.T.	Act. op.
Alabama	5	2	0	0	3	0	42,637	3	0	0	0	3	19,660	0	21
Arkansas	100	66	1	3	29	1	325,094	15	1	1	0	13	74,508	0	117
California	99	57	0	5	33	4	473,063	29	2	0	2	25	165,946	0	134
Colorado	59	12	1	7	39	0	307,354	29	5	0	2	22	160,405	0	95
Florida	1	0	0	0	1	0	11,898	1	0	0	0	1	11,898	0	1
Idaho	1	0	0	0	1	0	3,003	1	0	0	0	1	3,003	0	0
Illinois	237	92	0	4	100	41	496,347	27	1	0	2	24	40,439	12	407
Indiana	85	37	0	1	47	0	141,077	19	3	0	0	16	28,195	50	89
Kansas	336	154	3	14	157	8	1,156,488	72	12	0	3	57	280,880	0	392
Kentucky	424	222	0	3	199	0	326,360	14	1	0	0	13	22,552	394	251
Louisiana	345	174	27	16	126	2	2,529,122	64	5	5	1	53	525,720	0	494
North	139	73	0	13	53	0	488,946	34	2	0	1	31	169,454	0	197
South	172	86	19	2	64	1	1,707,408	27	3	2	0	22	318,770	0	250
Offshore	34	15	8	1	9	1	332,768	3	0	3	0	0	37,496	0	47
Michigan	36	15	0	6	15	0	103,275	13	1	0	1	11	50,500	19	134
Mississippi	33	14	1	1	17	0	300,079	15	2	0	0	13	147,738	0	76
Montana	39	16	0	1	22	0	175,234	17	3	0	1	13	81,351	2	71
Nebraska	53	14	0	0	39	0	301,712	28	3	0	0	25	163,871	0	44
New Mexico	118	77	3	14	24	0	515,930	21	2	1	0	18	101,416	47	199
New York	41	21	0	0	0	20	54,100	0	0	0	0	0	0	41	10
North Dakota	23	12	0	0	11	0	122,985	5	0	0	0	5	20,375	0	42
Ohio	101	47	0	24	25	5	276,185	3	1	0	0	2	12,252	100	162
Oklahoma	590	311	5	39	216	19	1,938,302	65	8	1	3	53	234,781	88	880
Pennsylvania	80	19	0	36	14	11	257,141	6	0	0	4	2	39,540	80	35
South Dakota	3	1	0	0	2	0	11,299	3	1	0	0	2	11,299	0	4
Tennessee	1	0	0	0	1	0	932	1	0	0	0	1	932	1	3
Texas	1,580	819	69	68	585	39	6,420,566	309	22	9	5	273	1,431,600	66	1,435
Dist. 1	103	51	4	3	45	0	254,577	22	0	0	0	22	58,795	0	53
Dist. 2	45	12	8	4	21	0	299,990	15	0	1	0	14	104,345	0	62
Dist. 3	153	66	19	3	59	6	975,637	19	3	2	0	14	157,164	0	120
Dist. 4	109	21	11	9	51	17	512,691	37	1	0	3	33	200,854	0	90
East	106	49	14	0	43	0	533,973	31	1	4	0	26	161,077	0	70
Dist. 7-B	275	122	1	5	144	3	716,653	65	2	0	0	63	197,161	0	86
West	438	324	8	7	97	2	2,015,545	65	7	1	1	56	285,954	29	695
Dist. 9	241	119	0	8	104	10	629,027	45	7	0	1	37	188,515	37	141
Dist. 10	110	55	4	29	21	1	482,473	10	1	1	0	8	77,735	0	118
Utah	24	12	0	0	12	0	140,749	7	0	0	0	7	42,635	0	46
West Virginia	51	3	0	44	1	3	138,870	4	0	0	4	0	22,819	51	195
Wyoming	78	31	0	4	43	0	356,095	26	2	0	1	23	161,336	0	156
Dec. 1958	4,543	2,228	110	290	1,762	153	16,925,897	797	75	17	29	676	3,855,651	951	5,493
Tota 1958	49,111	24,137	1,125	3,674	18,822	1,353	197,383,985	9,588	920	158	273	8,237	44,576,670	8,617	
Total 1957	53,838	27,476	688	3,912	20,701	1,061	221,900,539	11,739	1,172	105	375	10,087	55,794,214	7,289	

D.D. = 33: Okla. 12, Mont. 3, Utah 1, Wyo. 5, Texas (3) 3, Texas (2) 1, Texas (4) 2, Ill. 4, Ala. 1, Texas (1) 1.

Western Canada

December 1958

	ALL WELLS						Total	WILDCATS					Total
	Total	Oil	Gas	Dry	Service	Footage	1958	Total	Oil	Gas	Dry	Footage	1958
Alberta	157	95	15	46	1	894,478	1,658	42	5	10	27	242,171	415
Saskatchewan	74	49	0	25	0	319,293	783	23	4	0	19	99,784	209
Manitoba	3	3	0	0	0	6,313	87	0	0	0	0	0	11
British Columbia	8	3	2	3	0	37,849	86	7	2	2	3	34,094	67
Northwest Territories	0	0	0	0	0	0	7	0	0	0	0	0	7
Western Canada	242	150	17	74	1	1,257,933	2,621	72	11	12	49	376,049	709

section of the Bluesky. Recovery at the K-39-D Beatton River, 5 miles west of the Triassic oil pool, was 870 ft. of 43°-gravity oil.

Regular field pay at Beatton River is the Triassic D sand. Triad will go on down to test this zone at the new-pay strike, it is expected. Bluesky is Lower Cretaceous in age. There are three Triassic oil wells at Beatton River. Pay ranges in thickness from 10 to 25 ft. Production in the Triassic at about 3,800 ft. is excellent—up to 1,000 bbl. per day. Gravity is 40°.

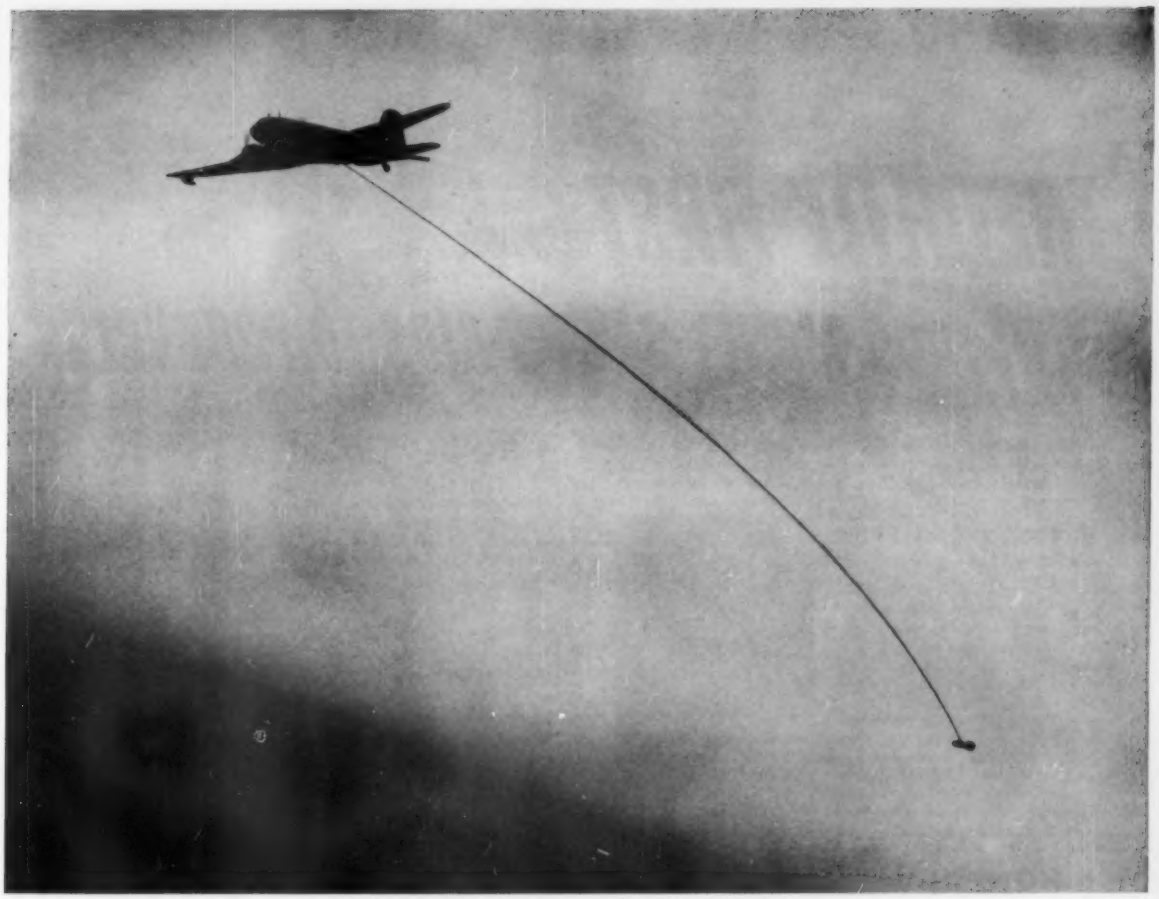
Deep Sooner field keeps growing

OKLAHOMA'S deepest producing area, Knox field in Grady and Stephens counties, added another good producer.

British-American Oil Producing Co. 1-X Hussey, SW SW NE 10-2n-5w, Stephens County, tested the third Bromide-Ordovician sand in open hole at 15,672-15,872 ft. Flow was 408 bbl. condensate per day and 2,900 M.c.f. of gas. Another test at 15,630-35 ft. got 1,680 M.c.f. of gas and 113 bbl. condensate per million.

Another find for Swan Hills region

ALBERTA'S famed Swan Hills region appears headed for another discovery. This time it is a Shell Oil Co. wildcat 26 miles southwest of the field itself and about 5 miles southeast of Vir-



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TRETOLITE SERVICE
report

TRETOLITE FIRST

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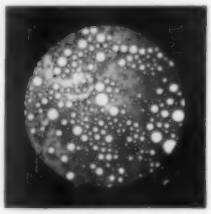
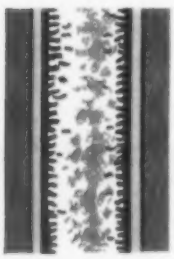


The first chemical demulsifier used in the petroleum industry for the recovery of emulsified crude oil was invented by William S. Barnickel, founder of the Tretolite Company. Since then, TRET-O-LITE demulsifiers have rendered useful millions of barrels of crude oil that might otherwise have been lost. Today, many TRET-O-LITE formulas are available not only for the recovery of emulsified production, but also for salt removal from crude oil, and useful- oil salvage from tank bottoms and slop oil systems.

2. KONTOL*
Organic Corrosion Inhibitors



Tretolite Company research and field engineering developed the first organic corrosion inhibitors specifically for petroleum equipment and pioneered their first application. Today, KONTOL Corrosion Inhibitors are used in the production (as well as refinery and pipeline) departments of leading oil companies everywhere.

3. SOLVO*
Paraffin Removers

Paraffin removers which contain neither carbon bisulfide nor organic chlorinated solvents were first introduced by Tretolite. The harmful effects of chlorides in crude oils on certain refining catalysts have made clear the need for such chloride-free paraffin removers.

4. FLUDEX*
Multi-purpose Water Flood Additives

Another Tretolite "first", this series of products combines the features of organic corrosion inhibitors, bactericides, scale preventives and wetting agents. Widely used in water-flood operations, FLUDEX additives increase injectivity, and at the same time, mitigate problems arising from corrosion, bacteria and scale. They are also being effectively applied for backwashing water-flood filters, water clarification, and stimulating production in stripper wells.

Because Tretolite has developed and pioneered the application of these products, this organization can offer you a brand of experience and service in the manufacture, use and know-how of these products that's unequalled anywhere else in the industry.

For further information on how these and other money-saving Tretolite aids can fit into *your* operation, *ask the Man in the Red Car*—your own Tretolite Field Service Engineer.

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TFS9-1

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PERU: International Gas Lift Company, Apartado 71, Talara
TRINIDAD: Neal and Massy, Ltd., Port of Spain, P.O. Box 544, San Fernando

ginia Hills, birthplace of the production in this region.

Shell's 6-34 Swan Hills, LSD 6, 34-64-13w5, recovered 1,140 ft. of oil and 1,570 ft. of heavily oil and gas-cut water cushion on a drill-stem test of the Beaverhill Lake-Middle Devonian at 9,362-9,422 ft. The well appears to have about 25 ft. of net pay.

New mark near for Los Angeles

AT LOS ANGELES, Standard Oil Co. of California, Western Operations, Inc., was nearing a new Los Angeles Basin depth mark with a wildcat in the community of Lynwood.

Standard was drilling ahead below 14,885 ft. with 15,500 ft. the target total depth. Nearest production is at the Rosecrans field 4 miles to the west.

The Los Angeles Basin depth mark is held by Shell Oil Co. who drilled a 14,950-ft. well in the Long Beach field in 1946.

A unique feature of the Standard test was that it was drilling with 13,880 ft. of open hole. The only casing in it was 1,005 ft. of 13⅜-in. pipe.

In other drilling action, Scott and Hendrickson plugged and abandoned a 5,020-ft. wildcat in the Cotati area of Sonoma County in northern California . . . Sunray Mid-Continent Oil Co. revealed its Refugio Cove gas discovery of last July in Santa Barbara County has been making around 1,205 M.c.f.d. when on production. It also produces about 6 bbl. daily of 62.2°-gravity condensate. This gas wildcat is located less than ¾-mile from the ocean and 2 miles west of the old Capitan oil field . . . Roy Gill, operator, was drilling ahead below 4,911 ft. on 1 Krum in Orange County. This wildcat, located near the famed San Juan Capistrano Mission, is the state's most southerly active drilling test.

Gilmore to drill in Los Angeles

THE AREA of the old Salt Lake oil field in Los Angeles is slated for a deep wildcat in the near future as the City Council approved a 108-acre drilling district near Beverly and Fairfax Boulevards. The permit allows for 3 wildcats and 10 development wells if production is found.

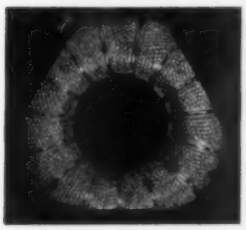
The acreage is in the Salt Lake field, which was discovered in 1902 with wells averaging around 2,000 ft. Any new wildcats will probably be slated for depths in excess of 10,000 ft.

Pipe set at San Joaquin test

TWENTY-INCH conductor pipe in a wildcat 3½ miles north of Los Lobos oil field in Kern County has been set by Ohio Oil Co. The projected total depth of the test, 11,000 ft., indicates it is associated with the San Emidio Nose discovery of Richfield Oil Corp. about 7 miles to the east. The Ohio well, 15-5 KCL-Q, is in NW SW 5-11n-22w, virtually on a straight line due west of the San Emidio Nose discovery in SE NW 9-11n-21w.

Other major companies are reportedly readying similar wildcats along the anticline which extends eastward across the southern San Joaquin Valley in Kern County. Until Richfield's discovery last July, the structure had defied operators for 20 years. As a matter of fact, Ohio originally located the Nose on the anticline in 1934. They drilled a 7,500-ft. dry hole in 1935. The Texas Co. took over in 1936 and deepened to 10,014 ft., but failed to get through Pliocene

CORES by D&S



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into the target Miocene. Shell Oil Co. also had a try with a 13,873-ft. wildcat in 1939 which hit the Miocene but found it too tight.

Richfield moved in after the war and failed with two dry holes while Continental Oil Co. and Western Gulf Oil Co. also had unsuccessful tries for production along the nose. Richfield alone spent more than $1,200,000 on the search before turning up the discovery.

Some of the bloom was taken off the area recently by a 12,656-ft. dry hole drilled by Bandini Petroleum Co. about 1½ miles northwest of the field. Currently, Richfield has three rigs drilling extensions north and east of the discovery.

Rare gas found in Kern County

IN CALIFORNIA, Golden Bear Oil Co. tapped a new gas field in Kern County with a wildcat located about 6 miles west of Shafter in SE NW 9-28s-24e. The operator shut in the 5,985-ft. test pending completion of pipeline facilities to a main gas line. The well, 1 Garrison City, tested at a rate of 1 M.M.c.f.d. with some condensate, through a 10/64-in. choke from a lower Etchegoin sand at 5,940-45 ft.

The nearest other gas production in the predominately black oil Kern County fields is about 6 miles due south at Bowerbank gas field.

Golden Bear drilled the well as operator for itself, Superior Oil Co., Tidewater Oil Co., Mitchel Co., and Gerald L. Rosen. A second test is slated for early drilling.

Two-zone pay for Glenn County

IN CALIFORNIA, Humble Oil & Refining Co. gave Glenn County's gas fields another significant completion with a two-zone completion of an extension test in the Bounde Creek area of the Princeton gas field.

The new well, 2 Bounde Creek, is located 800 ft. north of a new-pool discovery well completed more than 2 years ago in 13-18n-2w. Initial production on the new well was 2,336 M.c.f.d. through a ⅜-in. choke from the interval 2,842-67 ft. and 8,136 M.c.f.d. through a 5/16-in. choke of a selectively perforated interval between 5,420 ft. and 5,541 ft.

California highlights . . . Atlantic Oil Co. has slated a 15,000-ft. joint venture test with General Petroleum Corp.

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and F. E. Fairfield 2½ miles southeast of the Paloma field in Kern County. . . . The Texas Co. abandoned a 7,980-ft. wildcat 2 miles northwest of the Portals Fairfax area of the Edison field in Kern County . . . Hudson Gas & Oil Corp.'s third test of the Los Angeles Country Club property in west Los Angeles was standing idle and suspended at 5,515 ft.

Old California field due new play

THE SHALLOW, 60-year-old Kern River field in Kern County, is slated for a big drilling year as Tidewater Oil Co. announced it was starting the first 3 of 30 new wells slated in the field.

The first three tests in the big drilling program are scattered in different parts of the field.

In addition to the renewed activity at Kern River, Tidewater also announced five new tests are slated for the north Midway area of the Midway-Sunset field on the west side of the valley in Kern County.

Good oil find in Denver basin

COLORADO'S portion of the Denver basin started the new drilling year off with a good oil find in Logan County.

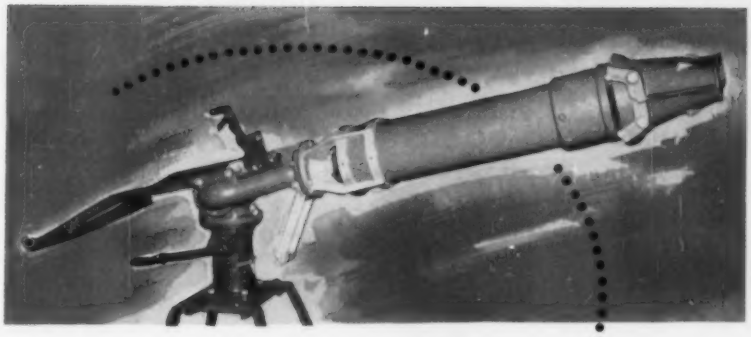
Cabeen Exploration Co. completed the 1 State-A in C SE NW 34-11n-54w flowing 300 bbl. of 38°-gravity oil daily on a 20/64-in. choke from Dakota D sand perforations at 5,079-83, 5,095-98, and 5,108-12 ft.

This new Cretaceous find is 1½ miles west of Little Hoot gas field, separated by a failure.

Old Bakersfield hunt renewed

THE FOURTH TEST in 2 years in Union Oil Co. of California's search for Stevens production in the city limits of Bakersfield was being readied. Three previous tries ended in dry holes. This latest effort has a surface location only 30 ft. south of the last test drilled, a 7,129-ft. hole abandoned last November.

The other dry holes were drilled from a location approximately 2½ miles southeast of the latest try. Of the four, three drilled and one getting ready, two were drilled near the old Union Avenue oil field in south Bakersfield, and the last dry hole and



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the test now planned are in the area immediately adjoining to the east the Fruitvale field in west Bakersfield.

Lagoon field opens in South Texas

DISCOVERY of a new field in the shallow water bed of Laguna Madre, off Kenedy County, in Texas' lower coastal region, has been made by Union Producing Co.

Nearest fields are Laguna Madre, 9½ miles southeast, and Portrero Lopena, about the same distance northeast. Both also are in Laguna Madre. Nearest onshore field is more than 15 miles northwest at Barreta.

Union's new well, in State Tract 348, is productive from Frio sand at 8,275-80 ft. after drilling to 17,320 ft. as one of the deepest tests in South Texas. It is rated on open-flow potential at 7,250 M.c.f.d. of gas, making 10 bbl. of 60°-gravity condensate per M.M.c.f. Shut-in pressure is 3,199 psi.

Union calls its discovery "Mesquite Rincon" after the name of a nearby land point. Drilling already is under way on another well ½ mile northeast in Tract 349.

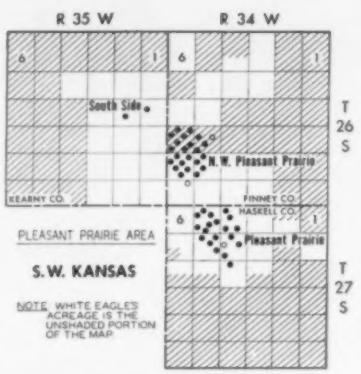
Big program set for Kansas field

IN Southwest Kansas, White Eagle Oil Co., Tulsa, has released a progress report covering its rapid oil-development program tied in with the scheduled completion of a 48-mile pipeline to serve its Pleasant Prairie area.

White Eagle now has 32 oil wells within three pools on its 25,000-acre block in the Hugoton gas field. Two drilling rigs are at work on a steady development program adding 3 wells per month, aiming for a target of 60 wells in operation by the end of 1959. Production comes from the St. Louis section of the Mississippian formation around 5,100 ft. with additional pay zones in some wells in the shallower Morrow and Kansas City-Lansing sections. Wells are spaced on 80-acre locations with Mississippian allowables set at 65 bbl. per day.

The new 6-in. pipeline is owned by Jayhawk Pipeline Co., Wichita, and connects with the company's recently constructed 242-mile main line from Meade County into McPherson and Valley Center.

White Eagle's discovery well in the Pleasant Prairie pool was drilled in 1954. The next year the company moved 5 miles northwest within its acreage block and drilled the initial well of the South Side pool. In 1956 the discovery of the Northwest Pleasant Prairie pool was made about halfway between the two earlier pools.



THE MOST PROMISING pre-Permian field inside Kansas' portion of Hugoton field is Pleasant Prairie.

Twenty-four producers were drilled by White Eagle before the first and only dry hole to date was encountered on one side of the Northwest Pleasant Prairie pool. Offset operators have completed 11 more wells with 2 now drilling. White Eagle geologists state

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that the net pay in the St. Louis section has ranged from 12 to 54 ft.

Swab tests during well-completion operations averaged 30 to 40 bbl. per hour, although the wells' state potential tests ordinarily reflect installed pump capacity of about 150 bbl. per

Illinois' Jefferson reports stepout find

A stepout discovery is reported in Jefferson County, Illinois. It is David F. Herley 1 Badger-Hails Unit in NW NE NW 22-1s-3e, 7 miles north of Mount Vernon.

This McClosky strike pumped 216 bbl. per day from perforations at 2,754-58 and 2,768-80 ft.

Deep field tapped inside Hugoton area

SOUTHWESTERN KANSAS picked up a new Morrow-Pennsylvanian oil discovery inside the limits of vast Hugoton Permian gas field.

W. J. Coppinger completed his well in C NE NW 12-29-34 flowing 51 bbl. of oil and 1,441 M.c.f.d. of gas from Morrow sand perforations at 5,294-5,319 ft. This new pool is 8 miles northwest of the town of Sublette and 4 miles east of South Eubank field.

Nebraska's Spath field is official

NEBRASKA'S new Spath field was officially opened last week at Shoreline Petroleum Co. 1 Spath in C NE SE 2-13n-55w. This Denver basin strike made 190 bbl. of oil and 2 bbl. of water per day from Dakota Cretaceous "J" sand perforations at 6,251-62 ft.

Location is 1¼ miles west of Torgeson field, nearest oil.

Oil-gas field opened in Ohio's Holmes

The Mid-East Oil Co. announced the completion of its 1 Paul Cotton, Section 16, Richland Township, Holmes County, as 250 bbl. and 400 M.c.f. initial 24-hour production, probably the best well in the Brinkhaven extension pool. Clinton sand was found at 3,160-3,200 ft. with 10 bbl. natural.

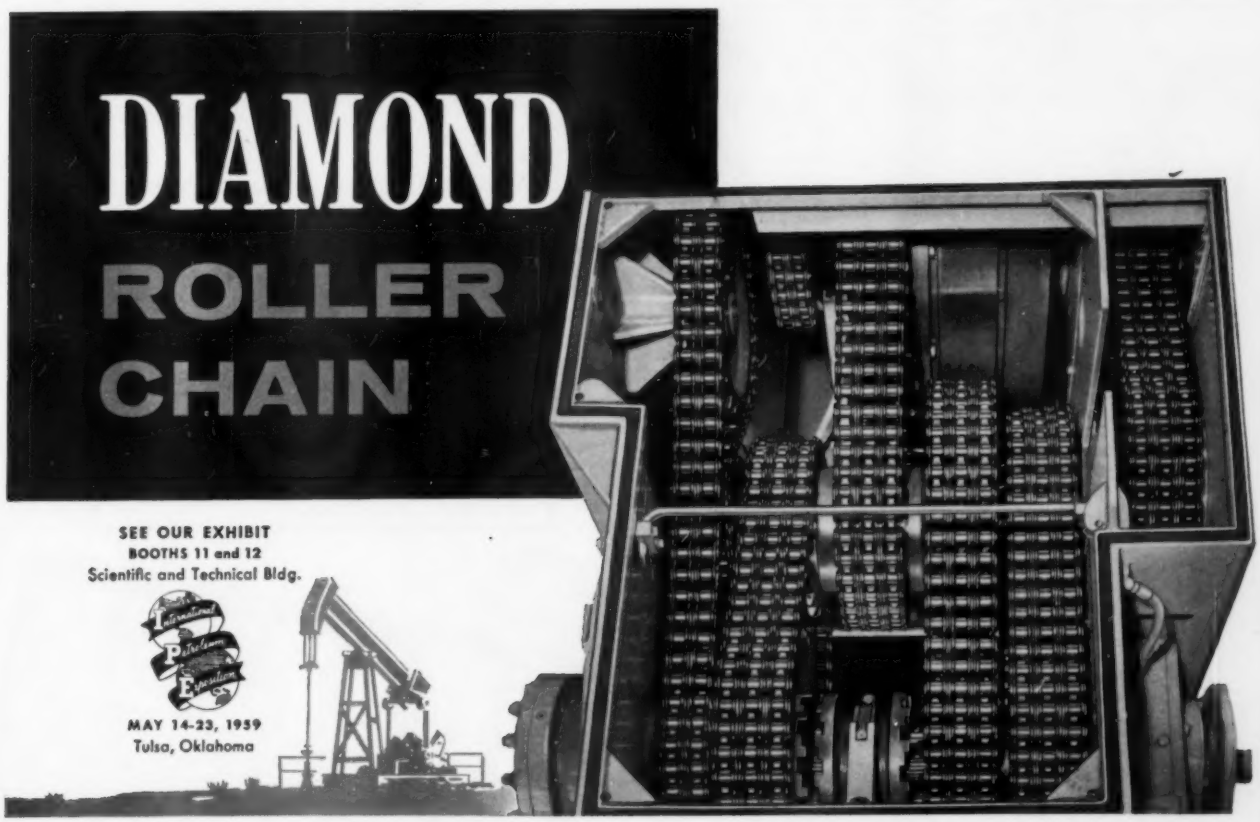
Kentucky's Big Sandy adds gasser

ON ELSWICK FORK of Lick Creek in the Pike County sector of Big Sandy gas field, Kentucky West Virginia Gas Co. have completed 6,439 A. J. Abshire as a Mississippian Big Lime gas well. Bottomed at 2,983 ft., best zone of productive pay was found from 2,958 to 2,975 ft. where an open flow resulted in 1,100 M.c.f.d. of gas natural. A rock pressure of 715 lb. was recorded in 36 hours.

Tristate field adds Jackson production

New-pay production was established in the area 6 miles northeast of Sebree in Henderson County, Kentucky. Universal Operating, Inc., 1 J. W. Porter, 22-O-25, swabbed 5 bbl. of oil per hour, natural, on test of Jackson sand at 1,925-45 ft. It flowed 6 bbl. per hour after treatment.

This field is about 14 months old. The discovery well, Universal 1 Roy Duncan, 22-O-25, was completed in November 1957. It made 40 bbl. of oil per day in the Tar Springs at 1,600-1,612 and Cypress at 1,967-76 ft.



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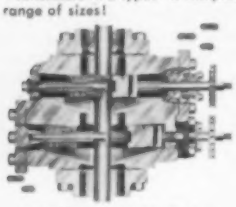

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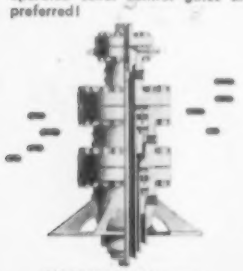
- Available in both *Double* (illustrated above) and *Single* types for operation by an air motor drive utilizing the air supply available at most rigs—*plus the protection of manual standby!*
- Even in sizes as large as 13⅜" (12" Series 900) the Double type requires less than 29" cellar height, the Single less than 17½"!
- Rams are changed by simply removing one end cover... quick draining ram compartments prevent accumulation of deterimental mud and sand... many other unique features make these gates top choice wherever *mechanically*-operated cellar control gates are preferred!



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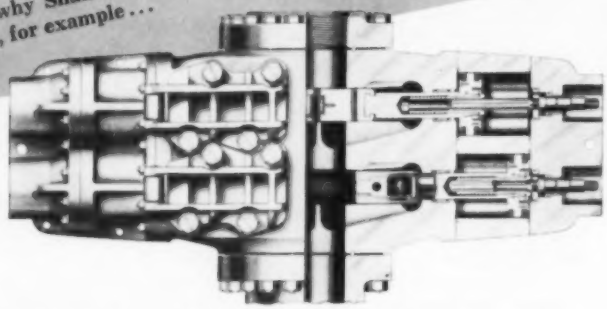
- Meet every requirement for modern, compact, casing and tubing suspension in wells of all depths.
- Available in various types and packing arrangements. Base Heads and Combination Base, Casing and Tubing Heads are available for combining several units into one where space is at a premium.

Shaffer also provides a complete line of modern Tubing Heads, Multiple Zone Hook-Ups and other control equipment for your landing, casing and tubing strings.

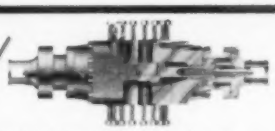


SHAFFER HYDRAULIC CELLAR CONTROL GATES

- Available in Both *Double* (illustrated above) and *Single* types. Both in choice of *Non-Rising* Locking Shafts (for those preferring maximum compactness) and *Rising* Locking Shafts (for those preferring quick indication of ram position.)
- They provide unequalled simplicity in changing rams. Simply unbolt two doors, change rams, close and bolt the doors. Rams are automatically aligned as the doors are bolted shut!
- They save cellar space. Even in sizes as large as 13⅜" (12" Series 900), the Double Gate (with *two* ram compartments in *one* body) is only 30" high...and the Single only 18½" high (Smaller sizes are even less)!
- Still other exclusive features—such as Direct Hydraulic Drive, Completely Enclosed Design, Quick-Draining Compartment Bottoms...make Shaffer Hydraulic Cellar Control Gates the outstanding choice of the industry.

They are available in a complete range of sizes and pressure ranges.

New!



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Large-Bore Preventers for Extra High Pressures!

Shaffer's new XHP Hydraulic Gates are not only in full production, but many are in actual field service, establishing advanced standards of pressure protection where unusually high well pressures are encountered.

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- ▶ Fluid lines are machined directly into the hinge pins so body can be swung open without breaking any fluid connections!
- ▶ Three bore sizes are available—7 1/16" bore for *working* pressures to 15,000 PSI—9" bore and 11" bore for *working* pressures to 10,000 PSI!

Write for new bulletin that provides full details on Shaffer XHP Preventers!

IN ADDITION, Shaffer provides the industry's most advanced line of Adjustable Flow Beans—the units that pioneered the adjustable flow bean principle and are still unequalled in efficiency. They are available with Conical, Micro and electrically-heated Therma Tips, in both regular and hard-metal designs to meet a wide range of drilling, production and refinery applications. Both flanged or screwed connections—in a wide choice of popular sizes!

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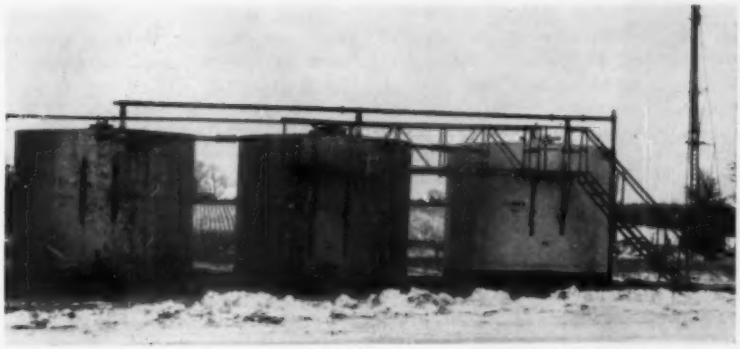

ACTION AT Turner Petroleum Corp. 1 Blair wildcat set off renewed leasing campaign in 12-county area of Michigan when well flowed 265 bbl. first day tested from 3,832 ft. the Trenton dolomite section. (See news section this week.)

IN MICHIGAN, Turner Petroleum Corp. President Fred W. Turner, center, and O. L. Martin, left, production superintendent, and Harry Kurchick, independent affiliate, are shown at 1 Blair wildcat strike, 20-4s-3w, Jackson County, midway between another important strike 6 miles northwest and Scipio field 5 miles southeast.

West Texas well flows reef oil

IN WEST TEXAS, Tennessee Gas Transmission Co. 1 Kay Kimbell, Pennsylvanian reef prospect 14 miles east of Seminole, reported a flow of oil on the latest of a series of drill-stem tests.

Recovery of oil and gas made on tests at 10,186-10,277 ft., and at 10,279-10,319 ft. The flow came on test at 10,319-69 ft. Fluid surfaced in 37 minutes, and when turned into pits, flowed oil at the rate of 20 bbl. an hour. Operators reversed out a full string of oil, with no water. Flowing pressure on the test ranged from 600-4,060 psi., increasing to 4,460 psi. when shut in.

Location is in Section 104, Block H, D&W Survey. It is ½ mile east of a 13,336-ft. dry hole and 6 miles south of Medlin field.

First oil for Oklahoma's Ellis

OKLAHOMA'S gas-producing Ellis County added its first oil well last week. Skelly Oil Co. 1 Alexander, C SW NE 25-24n-26w, inside Northeast Catesby gas pool, flowed 128 bbl. of 43°-gravity oil per day from lower Morrow-Pennsylvanian at 8,131-54 ft.

This first oil well for the county

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comes about 1 year after first production of any kind was opened in this northwestern county. There are seven gas pools in the county with several other wildcats now showing for production.

Five rigs probe Sooner's McClain

IN OKLAHOMA Sunray Mid-Continent Oil Co. has completed five new producers in McClain County. Four of the new oil wells are in the Criner-Payne area and the fifth is in the nearby Flint Creek field. Sunray also has five rigs running in the area at the present time in an intensive development program.

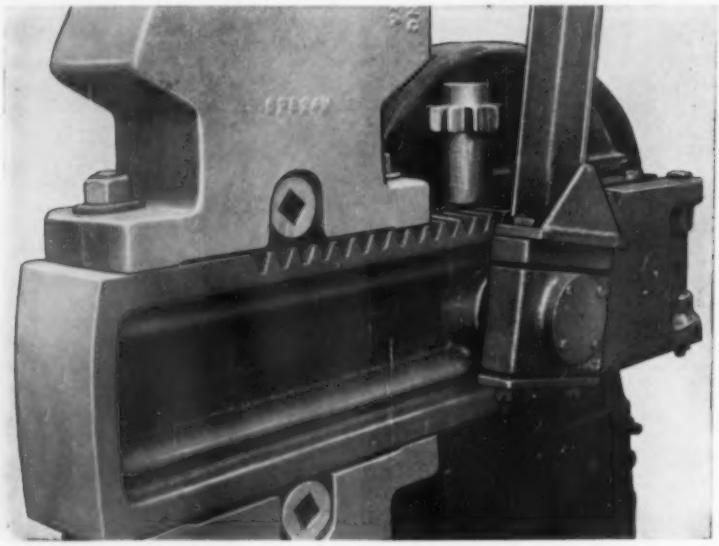
The 4 A. Manning, C SW SW 10-5n-3w, flowed at the rate of 262 bbl. of oil a day on 12/64-in. choke with tubing pressure of 775 lb. Oil gravity was 37°. Perforations were made from 8,301-36 ft. opposite the Hunton zone. The well is in East Payne field. Total depth of the hole is 8,600 ft.

The 1 M. Hawkins "D," C NE NE 9-5n-3w, another East Payne field completion, flowed at the daily rate of 168 bbl. of 37°-gravity oil on a test through 20/64-in. choke. Tubing pressure was 500 psi. The Hunton lime is producing through perforations at 8,633-60 ft. Total depth is 9,650 ft.

The 1 H. J. Hedrick, located in C SW SE 16-5n-3w, in Northeast Payne field, flowed oil at the rate of 126 bbl. a day on 10/64-in. choke with tubing pressure 700 lb. and gas-oil ratio 995:1. Perforations were from 8,318-32 ft. in the Hunton zone. Total depth of the hole is 8,736 ft.

The 1 H. Little "B," C SE SW 9-5n-3w, an East Payne field producer, flowed at the rate of 80 bbl. of 37°-gravity oil a day on a test through a 7/64-in. choke. Tubing pressure was 825 lb. Another Hunton zone producer, the pipe was perforated at intervals from 8,601 to 8,671 ft. with the hole drilled to a total depth of 8,800 ft. The 2 H. Little "B," a north offset, is now drilling and a west offset is in the planning stage.

The 1 Price-McDonald, a Flint Creek field producer located in C SE NE 36-6n-3w, McClain County, about 2 miles east of Criner-Payne field, flowed 104 bbl. of oil on a 24-hour test through 9/64-in. choke. Tubing pressure was 700 psi., gas-oil ratio 933:1, gravity 37°. The well is producing from perforations at 7,801-10 ft. opposite the Hunton zone.



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JENSEN JACKS

Oregon operations at standstill

THE 10-farmer syndicate making up the Linn County Oil Development Co. still hadn't tried to put its wildcat, 1 Barr, on production after suspending operations shortly before Christmas.

Before suspension, the 4,529-ft. test in Linn County, reportedly had both gas and oil shows. The rig has been moved off and a christmas tree installed. The operators reportedly are going to wait out the rainy season before resuming operations.

Wilcox pays near Texas' Sealy field

A WILDCAT located 1½ miles from Sealy field, in southern Austin County, Texas Gulf Coast, is proving productive of gas and condensate from Wilcox sand at 8,786-8,816 ft. after drilling to 9,511 ft. The discovery is classified as a major extension, in a new fault block, of the old Sealy field, discovered in 1942.

Completion is by Shell Oil Co., which took over the hole, 1 Zaruba, drilled by Scurlock Oil Co. The well is rated good for 28 M.M.c.f.d. of

gas on open-flow potential. Liquid recovery is estimated at 12 bbl. of 49°-gravity condensate per 1 M.M.c.f.

Scurlock Oil Co. is drilling a confirmation test, located southeast of the extension discovery, at its 2 Cole Gas Unit 1.

The area is 4 miles west of Sealy townsite.

Deep try due Texas' Matador

A LITTLE-EXPLORED AREA of West Texas is in line for further deep exploration. General Crude Oil Co. last week announced location for a 10,000-ft. wildcat to be drilled 14 miles northwest of Matador townsite in Motley County.

The new operation is 1 I. F. Fish, located in the SE SE Section 4, Block H-F, in I. F. Fish Survey 4. Ground elevation is 2,605 ft. There is no nearby production.

No. 1 Fish is reported to be on a 5,097-acre lease. It is 4 miles northwest of Pan American Petroleum Co. 1 O. E. Birnie, which was originally drilled by Amerada Petroleum Corp. to 10,010 ft. Pan American Petroleum reentered the hole in August 1958 to test around 8,518-25 ft. Perforations at that interval, not identified as to

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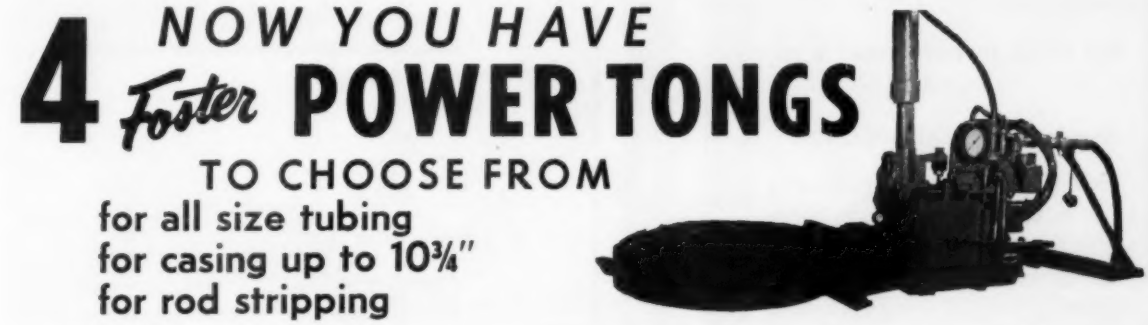
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THOMPSON
SAND RESISTANCE
OIL WELL PUMPS

TRAVELING PLUNGER ROD TYPE BOTTOM HOLD-DOWN PUMP STANDARD SIZE

Figs. 400P, 600P, 700P, 800P

Single or double, self-aligning, combination cup and plunger or all-metal traveling plunger type, pumps made in four sizes: regular 1½", 1⅝" oversize, 2" regular and 2⅛" oversize bore. These pumps seat in API seating device. In very sandy wells, or when tubing is out, we recommend our SAND HOUSING MECHANICAL SEATING SHOE, which prevents sanding in of pumps as sand can be pumped and the pump pulled at any time by our sand flushing arrangement.

TOP HOLD DOWN INSERT ROD PUMP

Standard Size, Figs. 400T, 500T

Self-aligning double plunger insert pumps. Made in three types: combination cup and single plunger; combination cup and double self-aligning type; and metal-to-metal double plunger self-aligning type. All are equipped with Regular or Extra Long Alloy Plungers, ground individually to fit the barrels, assuring longer life on both pump and surface equipment.

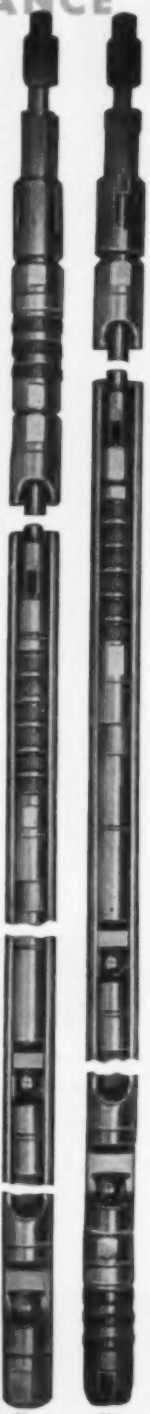

Fig. 400P 600P 700P 800P

Fig. 400T 500T

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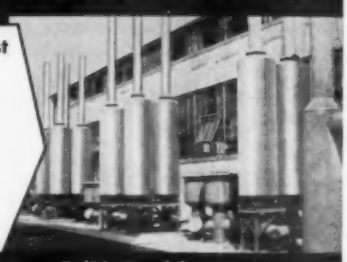

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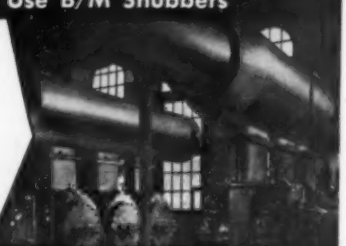

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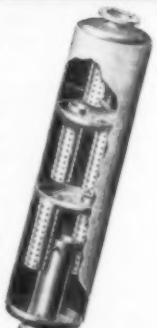

Submit Your Problems for recommendations

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formation, produced some 600 M.c.f.d. of gas plus 20 bbl. of 60° condensate.

Southern Motley County, just north of the Matador uplift, and east of Roaring Springs has Permo-Pennsylvanian production, above 5,000 ft.

Tired gasser gets oil production

A DEPLETED GAS WELL in the Texas Panhandle has been recompleted for good oil production from a new oil zone by Pan American Petroleum Corp.

Pan American 1 Carmody, located in Section 3, Block 4T, T&NO Survey, Hansford County, Texas, flowed 212 bbl. of oil in 10 hours through a 24/64-in. choke on a completion test.

Recovery was from the Marmaton, topped at 6,472 ft. through perforations 6,472-78 ft. The 1 Carmody was originally completed by Pan Am as a gas well in May 1958, for initial gas recovery of 3.5 M.M.c.f.d.

The original gas recovery was from the Morrow, through perforations 7,360-70 ft., and the well was drilled to a total depth of 7,900 ft., plugged back to 7,405 ft. The gas production declined until depletion was reached, and Pan Am has now recompleted as an oil producer after plugging back the well to 6,548 ft.

Oil recovery from the Marmaton is the first from the zone in this area. Pan Am holds full interest in the well and in some 5,000 acres in the immediate area.

Action brisk in Matagorda County

NEW DISCOVERIES in the Texas coast's Matagorda County are opening at least two additional fields, indicating another, and providing another major extension to the already expansive Palacios fields.

New fields include a dual-zone discovery by Monsanto Chemical Co. at its 1 Fay in the Thomas Jamison Survey, east of Elmaton, in the central part of the county.

The well, more than 3 miles from nearest other field, is productive of oil from pay at 10,036-43 ft., and gas and condensate from a deeper pay at 10,120-30 ft.

Oil flow tested 247 bbl. daily through 6/64-in. choke. Gravity of the oil is 36.8°. Oil was with 304 M.c.f.d. of gas. Shut-in pressure is 2,166 psi. Flow from the deeper zone was 3,880 M.c.f. of gas and 139 bbl. of 52°-gravity condensate per day through an adjustable choke.

Location is west of the old Buckeye

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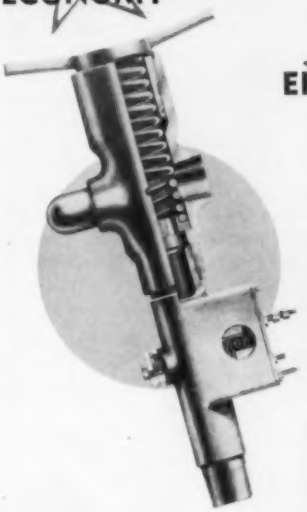

NEW GARRETT MAGNETIC FREE PISTON RECEIVERS

Designed with economy in mind, the new Garrett Magnetic Receivers provide more precise control of free piston cycles — permit an almost unlimited variety of operating procedures—may be used with any of the new Garrett Free Pistons. Supplied with manual or automatic catcher, as desired.

PLUS...AN ENTIRELY NEW FAMILY OF GARRETT FREE PISTONS

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Single metal packer—for oil wells with high lifting - pressure differentials.

TYPE "C-E"

Rigid packer without valve—a low cost piston for de-watering gas wells.

TYPE "C-M"

Rigid packer with snap-acting valve —for average oil and gas wells.

Garrett Magnetic Receivers and Free Pistons are furnished in sizes from 1¼" to 2½". For complete information, contact your Garrett representative or write for Bulletin No. 159 PC.

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Division U. S. Industries, Inc.

P. O. Box 2427, Longview, Texas

field, northwest of Wilson Creek field, and 3½ miles east of Tidehaven field. "El Maton" is proposed as the name of the new field.

Another new discovery by Roy R. Gardner and Ralph Lowe 3 miles north of Palacios is productive of gas and condensate from the Frio-Melbourne sand at 9,018-26 ft. The well is rated good for 17,500 M.c.f.d. of gas, open flow, yielding 54.7°-gravity condensate in the ratio of 38,800 cu. ft. of gas per barrel of liquid. Shut-in pressure is 3,379 psi.

Location is west of North Collegeport field and 1½ miles north of production at Palacios. The discovery is being set up as a separate field named "Bruce-Flo."

Skelly Oil Co. has indications of another new-field discovery 6 miles north of Palacios at its 1 Jackson, in the Nathaniel Reed Survey. The well, drilled to 9,800 ft., is testing perforated intervals at 8,880-84 ft. and 8,868-79 ft., showing gas and condensate. It is a mile southwest of a gas-discovery well, 1 McDonald, completed last year by M. T. Halbouty.

Extension of Palacios field is by Tidewater Oil Co. at its 1 Richman, in the William Parks Survey, ½ mile east of production. Production is from the field's Frio-E sand, perforated at 8,878-84 ft. Open-flow potential is 15,800 M.c.f.d. of gas with a gas-condensate ratio of 38,100 cu. ft. per barrel. Gravity of the condensate is 58.7°. Shut-in pressure is 3,378 psi.

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On offshore rigs the reclamation of mud is vitally important and the separation of shale and abrasives from drilling muds means a more effective, time and money saving drilling job. Barnwell Offshore, Inc. chose Thompson for their new offshore rig, the VINEGARROON, because it was field proven, will give them clean mud and make tools last longer, with a minimum of re-tooling and restoration of mud solution.

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Giant Pecos field continues growth

AN ELLENBURGER gas well has extended Puckett field in Pecos County 1¼ miles to the northeast. Standard Oil Co. of Texas 1-2 Mitchell-Thomas, in SW SW Section 33, Block 100, EL&RR Survey, was completed for 10,250 M.c.f. of gas a day, with a trace of condensate. Pay was openhole in the Ellenburger at 14,463-14,853 ft.

Puckett is a multipay field, and generally is credited with being the largest single gas reservoir in West Texas. It has been defined with dry holes only on its southwest side.

East Texas drilling tempo increases

ANDERSON COUNTY drilling last week picked up five new operations; two of these were in the Bethel salt dome area and three were in Cayuga field area.

William D. McBee, Dallas, will drill 1 Bruce Nolley to around 7,500 ft., on the east side of Bethel dome. The projected depth would test the Woodbine, but reports said it might be carried on down to the Rodessa. Location is 2½ miles southeast of Bethel townsite, in A. M. Lewis Survey, A-481. This places the well immediately west of the East Bethel field discovery, which was completed from perforations in the Rodessa at 9,793-9-839 ft., making a calculated 4,600 M.c.f.d. of gas, plus 173 bbl. of condensate per 1 M.M.c.f.

The Texas Co. has made location for a Woodbine test on the west side of Bethel dome, in Bethel field. The project is 1 Estella Ross, on a 60-acre tract in Thomas H. Kingsley Survey, Juan N. Acosta Grant. Contract depth is 6,800 ft.

Texaco's 1 Derden, a Rodessa project ½ mile northwest of the East Bethel discovery, was drilling ahead at 6,539 ft. at last report.

Cayuga area . . . New life for an old field was injected last week in the form of three active locations. Cayuga field is in northwestern Anderson County.

J. Afton Burke and Cayuga Oil & Gas Co. have two locations 2½ miles

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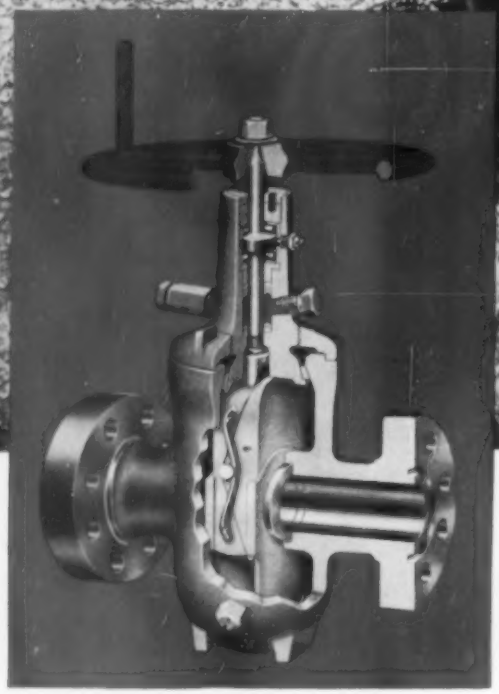

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north of Cayuga. Burke is listed as operator for 1 J. W. Barton, on a 129-acre tract in the Thomas Bristow Survey. Cayuga Oil will be operator at 1 A. G. Williams, located on a 193-acre tract in the Isaac Clendennen Survey.

W. R. Kinabrew, Paris, Tex., has made location for 1 S. H. Sellers, 3 miles west ot Cayuga on a 986-acre tract in the Everett Ritter Survey.

Drillers fish in Washington well

IN WASHINGTON, Sunshine Mining Co. was fishing after drilling only 20 ft. on its redrill project of the former 4 Hawksworth State in the Ocean City area of Grays Harbor County.

This well was originally drilled to 3,731 ft. by Tom Hawksworth in 1951 and completed as a flowing 35-bbl.-daily condensate well in 126 ft. of zone. Production fell off within days and the well was abandoned.

It is in the same section as Sunshine's Ocean City discovery well, still Washington's only oil well. The Sunshine well, 1 Medina, is currently pumping 10 bbl. daily. The operator plans to deepen 4 Hawksworth to 4,700 ft. in an attempt to tap the producing formation of 1 Medina.

HUNTON LIME gas production is reported at a remote wildcat in northwestern Oklahoma's Major County.

Oklahoma wildcat gets Hunton gas

GAS from the Hunton (Siluro-Devonian) lime is reported at Sinclair Oil & Gas Co. 1 Spafford, remote wildcat in Major County, northwestern Oklahoma.

On a 1-hour drill-stem test of the Hunton at 8,306-32 ft., the well flowed gas in 1 minute gaging from 3,120 to 4,070 M.c.f.d. Recovery

Here is a new full-revolving, stationary-mounted crane — the UNIT Mariner — specially designed for off-shore drilling operations. Conceived, developed and perfected by UNIT, the Mariner meets all requirements for cargo handling from a fixed mounting as applied to ships, barges or off-shore platforms. Unlike conventional cranes, the Mariner emphasizes unusual strength in turntable, roller path, rollers, hook shoes, boom and hoist mechanism.

A special, heavy-duty "A" frame permits capacity loads with extended boom at long radius. The famous UNIT sealed cast gear case serves as a protection against salt spray.

SAFETY is a major feature. Incorporated in the Mariner design, are positive and mechanical boom stops. These boom stops control the angle of elevation and prevent the boom from whipping back. Also the safety-promoting Full Vision Cab enables the operator to see what he is doing at all times. Load ratings are based on high factors of safety.

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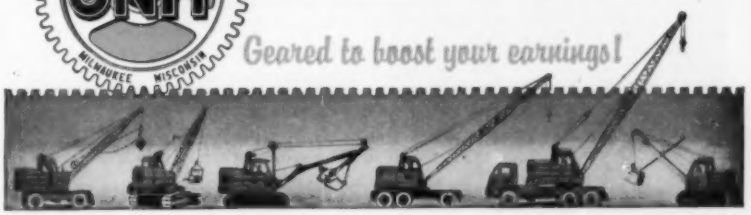
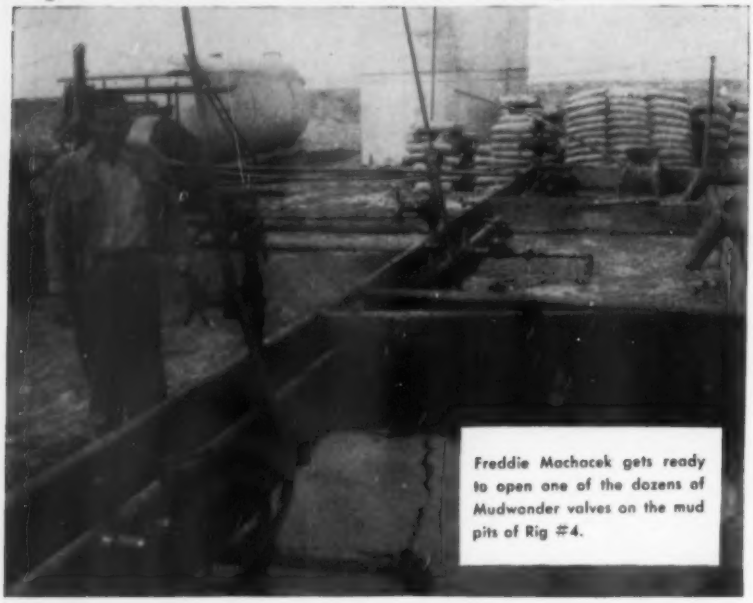


Tips on Mud Valves for Toolpushers . .



Freddie Machacek gets ready to open one of the dozens of Mudwonder valves on the mud pits of Rig #4.

MUDWONDER Ideal for Versatile Service

by Freddie Machacek, Toolpusher, Rig #4
B.B.M. Drilling Company, Midland, Texas

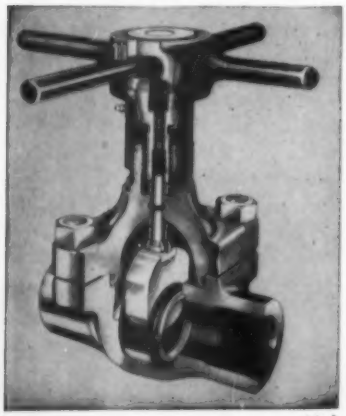
ABOUT two years ago I put a *Mudwonder* valve on our fill-up line just to see how it would make out. I soon found that *Mudwonder* worked fast and easily, without binding, even while bleeding off the line at 1600 lbs pressure. It did so well I tried more *Mudwonders* on the tough job of mud pit service—and they were so successful I've standardized on *Mudwonder* ever since!

Valves on mud guns and jets take a terrific beating, but we've had very little trouble with *Mudwonders.* As a matter of fact, our first ones are still in service; we replaced the stem packing on one valve—that's all! Because replacement parts are so easy to identify, we never have any trouble getting the exact part we need. In fact, the valves are designed to use the same seat and gate for both pressure classes.

When we have to dress a *Mudwonder,* the job can be done without disturbing any connections. The valve is out of service only about 10 minutes, start to finish, regardless of size. Another thing—they never sand up. Bob Lawrence, Edward *Mudwonder* Representative, says this is because the design causes the mud to flush the bonnet automatically.

Mudwonder valves are available in 2", 3" and 4" sizes; with screwed or flanged ends; rated at 2000 psi WP (4000 psi test) and 3000 psi WP (6000 psi test). See your favorite oil field supply store for complete information, or write Edward Valves, Inc., East Chicago, Indiana, subsidiary of Rockwell Manufacturing Company.

Mudwonder cut-away view shows the one-piece seat insert, with Buna-N molded integrally over steel wear rings; chromed gate with "T" slot connection; separated stainless stem and double thread construction.



(Advertisement)

netted 5 ft. of 50°-gravity condensate. Hunton lime was topped at 8,302 ft.

Location is in NE SE SW 33-23n-16w, on a large block of Sinclair-owned acreage.

WYOMING'S Little Worm Creek gas field added its third producer. The field opened in early 1958.

Green River field has three gassers

DAKOTA gas production at Caulkins Oil Co. 42-7 UPRR gives Wyoming's Little Worm Creek field its third producer.

This Sweetwater County well flowed at the daily rate of 12 M.M.c.f. on drill-stem test at 3,827-64 ft. The Cretaceous field was opened in early 1958 and was confirmed with a new-pay discovery at 2-8 Federal in C SW NW 8-15n-104w. Gas flowed at the rate of 4,500 M.c.f. daily from Dakota, but flowed 163 bbl. of oil from the Morrison-Jurassic on ½-in. choke.

West Texas test

A WILDCAT PROSPECT 5 miles east of Nena Lucia field, Skelly Oil Co. 1 J. G. Adams was running casing for completion attempt after recovering clean oil on two drill-stem tests of the Ellenburger.

Best recovery was at 7,000-89 ft., which netted 810 ft. of 42° oil and 200 ft. of heavily oil and gas-cut mud. Top of the Ellenburger was 7,077 ft.

New Minnelusa field confirmed

IN WYOMING, Pan American Petroleum Corp. has successfully completed its State of Wyoming "C" 1, confirmation well in Robinson Ranch field, Crook County. Pan Am operates the well and shares interest in it with Husky Oil Co.

The State "C" 1, located ½ mile

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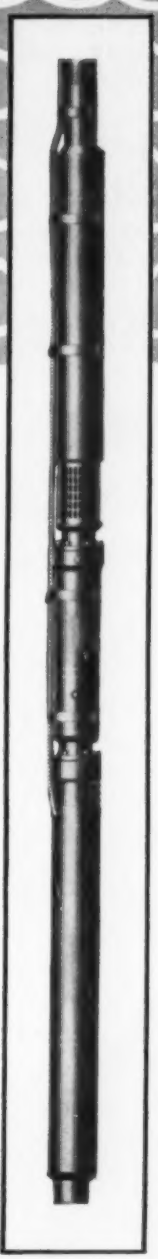

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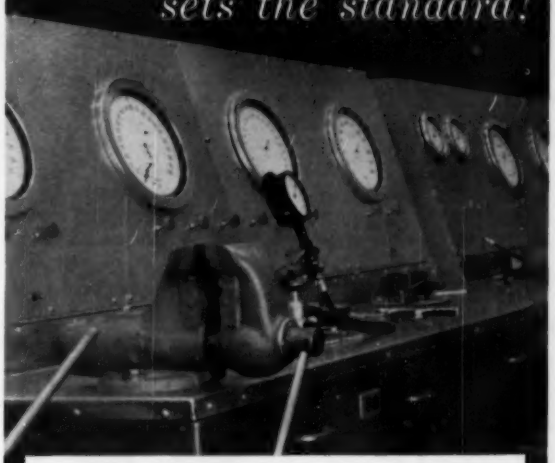

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Laboratory test gages must provide the utmost in dependability, accuracy, and sensitivity. Thus it was only natural for Northrop Aircraft, Inc. to choose Acragage for calibrating aircraft test gages. Seven 12" and two 4½" Acragage Solid Front Test Gages are used in the instrument repair shop of Northrop's engineering test laboratories.

This particular Acragage application is typical of the faith placed in products bearing the Acragage name. It's a faith borne of quality workmanship and outstanding features touching on the **entire** Acragage line of products, standard service gages as well as test gages. These features include the solid front case with full area rear blowout disc for positive protection, the longer Bourdon Tube (for greater tip travel assuring consistently accurate indication), and a wide choice of tube materials. Whatever your gage requirements, Acragage stands ready to serve you with the finest line of indicating instruments. Mail coupon for more information and catalog!

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north of the discovery well, Pan Am 1 Robinson, flowed 228 bbl. of 27°-gravity oil in 10 hours, with 1.4% water, through a 22/64-in. choke.

Recovery was from the Minnelusa through perforations 5,986-97 ft. and 6,007-25 ft. Net pay is estimated at 59 ft., with top of the Minnelusa at 5,986 ft.

The well was drilled to a total depth of 6,247 ft., plugged back to 6,117 ft. It is located in 29-50n-67w, Crook County.

The 1 Robinson was completed November 25 for 294 bbl. of oil a day on the pump. The discovery is owned 100% by Pan American. The discovery, and the 2 Robinson, now drilling, are located on a 6,000-acre tract, also owned 100% by Pan Am. The State "C" 1 is located on a separate 160-acre tract in which Pan Am and Husky own 50% each and Pan Am is operator.

South Texas test hits gas production

A DEEP WILDCAT in southwestern Brooks County, Southwest Texas, is paying off for The Texas Co. with a gas-condensate discovery.

It is Texaco's 19 McGill Brothers Ranch, in Section 12, San Antonio Grant, northeast of Encinitas and 10 miles southwest of Rachal. It is 4 miles east of Kelsey Deep field and slightly farther south of Alta Mesa field.

The well flowed an ungaged volume of gas and condensate in a preliminary drill-stem test of a casing-perforated interval at 8,830-50 ft. in Frio-Vicksburg sand. Flowing pressure through the ¼-in. chokes was 3,300 psi. Hole had been drilled to 11,605 ft.

On the southeast side of East Alta Mesa field, northeast of Texaco's discovery, Standard Oil Co. of Texas has new gas-condensate production after deepening its 6 Braulia G. de Garcia Lease 1 from former total depth of 6,740 ft. to 8,193 ft.

In Vicksburg sand, perforated at 7,371-77 ft., 7,388-96 ft., and 7,401-07 ft., the well flowed at the rate of 2,278 M.c.f.d. of gas through ¼-in. choke, registering top pressure of 3,900 psi., and bottom-hole pressure of 5,120-5,405 psi. Gas was wet but no gage or estimate condensate recovery was made.

Red Desert basin giant fattens

A BIG ADDITION to Wyoming's Desert Springs Unit gas field in the Red Desert basin is reported. El Paso Natural Gas Co. gaged 40 M.M.c.f.d. of gas from Lewis Cretaceous sand through perforations at 5,740-60, 5,770-95, and 5,860-70 ft. at the 6 Unit, SW NE SE 9-20n-98w. This is a southern extension to the Sweetwater County gas area. Location is just under 1 mile south of field production.

This field, one of last year's exploratory highlights in Wyoming, produces from Lewis and Mesaverde.

Discovery wells

CALIFORNIA

Kern County: Golden Bear Oil Co. 1 Garrison City Unit-Mitchel, SE NW 9-28s-24e, 1 M.M.c.f.d., some condensate, 10/64-in. choke, perfs. 5,940-45 ft., TD 5,985 ft. (New gas-field discovery 4 miles southeast of Semitropic field).

Tehama County: Humble Oil & Refining Co. 1 James W. Morgan et al., SW NW 9-23n-3w, 1,118 M.c.f.d., ½-in. choke, 750 tubing pressure, perfs. 4,022-53 ft. TD 5,435 ft. (New field discovery 4½ miles southwest of South Dome gas field.)

Los Angeles County: Zephyr Oil Co., 8-5 Banning, SE SE 29-4s-13w, 500 BOPD, 28° gravity, ½-in. choke, perfs. 6,315-6,698 ft. TD 6,698 ft. (New deeper pool discovery in a Schist zone on the north edge of the Wilmington field.)

Santa Barbara County: L. E. Broadhurst 2 Mercedes-Fox, SE NE 31-5n-32w, 48

WHICH IS THE **ECONOMICAL** WAY?

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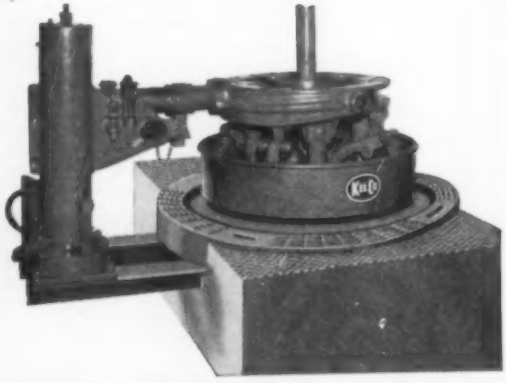

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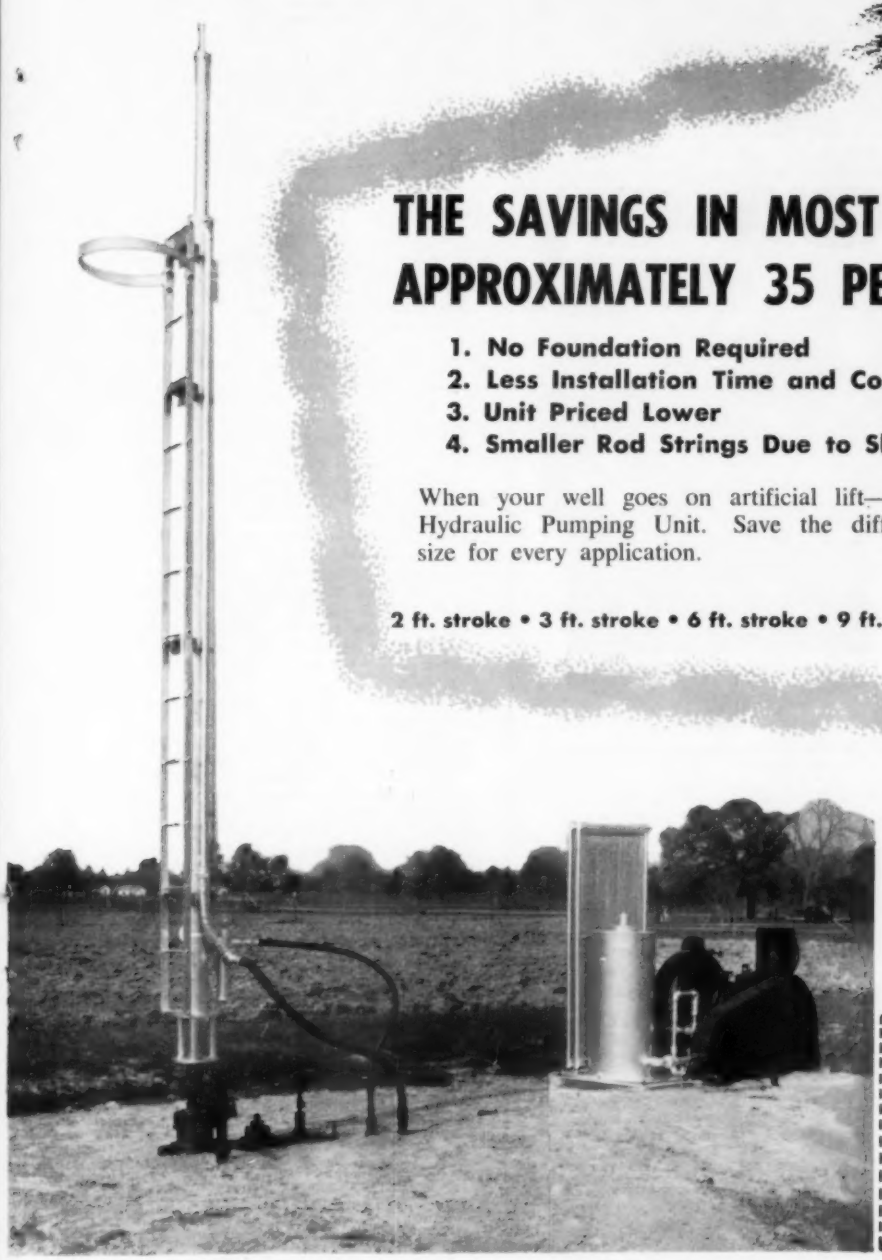

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Close-up view, above, shows 4" Barco "Jacketed" Ball Joint on asphalt loading arm. Note counterweight extension on joint. This single joint provides for 360° vertical swivel movement and 30° horizontal flexibility. (Photos: PHILLIPS PETROLEUM COMPANY, Kansas City, Kansas)

BARCO Flexible Ball Joints

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FEATURES

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BOPD, 12° gravity, TD 4,049 ft. (New field discovery in Gavioxta area).

WESTERN CANADA

Alberta: Mobil 10-20-61-12 Whitecourt, LSD 10, 20-61-12w5. Beaverhill Lake gas discovery. TD 8,990 ft.

Saskatchewan: Devon-Palmer-Renwar 1-27-5-7 North Cullen, LSD 1, 27-5-7w2. Mission Canyon oil discovery. TD 4,687 ft.

SOUTH LOUISIANA

Acadia Parish: Callery-Kilroy-Pioneer 1 Grabiel Trahan, 38-9s-2e. IP 118 BOPD, 114.9 M.c.f.d., 12/64-in., 35°, GOR 974 cu. ft. per barrel, TP 530 psi., perf. 13,148-13,220 ft. TD 14,935 ft. Second well and new pay in West Rayne field.

Ascension Parish: Austral Oil Co., Inc., 1 Knost et al., 8-10s-4e, 2½ miles northwest of Sorrento field. IP 150 BOPD, 7/64-in., 35.2°, TP 1,585 psi., GOR 705 cu. ft. per bbl., perf. 10,121-38 ft. TD 11,132 ft. New field.

Lafayette Parish: J. P. Owen—Columbian Carbon Co.—Tidewater Oil Co. 1 Saul Sonnier, 12-9s-3e, 2½ miles east of South Bosco field. IP 565 BCPD, 3,440 M.c.f.d., 12/64-in., 44.5°, TP 5,900 psi., perf. 12,856-86 ft., and 476 BOPD, 2,270 M.c.f.d., 10/64-in., 47.2°, 6,150 psi., perf. 12,575-83 ft. TD 13,596 ft. Discovery well of North Ossun field.

Plaquemines Parish: American Natural Gas Producing Co. 1 John Meyer Co., 41-19s-28e. IP 294 BOPD, 492 M.c.f.d., 8/64-in., 32°, GOR 1,672 cu. ft. per barrel, TP 2,300 psi., perf. 11,387-11,407 ft. TD 12,505 ft. New field—Nairn.

J. W. Mecom 2-K L.L.&E., 39-19s-27e. IP 178 BOPD, 7/64-in., 39.3°, TP 1,850 psi., GOR 1,696 cu. ft. per bbl., perf. 16,788-16,832 ft. TD 17,975 ft. New pay in Lake Washington field.

Gulf Oil Corp. 2 Buras Levee District "D", 18-23s-31e. IP 1,495 M.c.f.d., 10/64-in., dry gas, TP 2,875 psi., perf. 7,333-40 ft. TD 9,500 ft. New gas discovery 1½ miles southeast of West Bay oil field.

Vermilion Parish: Sid Richardson Carbon Co. 1 Noelie Hebert Broussard Unit et al., 23-11s-2w. IP 85 BOPD, 1,460 M.c.f.d., 57.9°, TP 4,267 psi., perf. 15,812-15 ft. and 15,865-80 ft. TD 18,105 ft. Second well and new pay in Riceville field.

Trunkline Gas Co. and Cyprus Oil Co. 1 Joseph Stansbury, 16-12s-4e, 5 miles northeast of Abbeville. IP 272 BCPD and 4,266 M.c.f.d., $\frac{3}{4}$-in., TP 9,830 psi., perf. 14,415-18 ft. and 14,222-23 ft. TD 15,520 ft. Discovery well Grosse Isle field.

LOUISIANA OFFSHORE

Eugene Island area: Placid Oil Co. 1 OCS-0436, Block 199, Eugene Island area, Gulf of Mexico, St. Mary Parish. IP 151 BOPD and 3,720 M.c.f.d., 12/64-in., 44.6°, TP 4,500 psi., perf. 13,506-34 ft. TD 14,310 ft. New offshore field.

South Marsh Island Area: The Texas Co. 1 State Lease 340-Mound Point-OCS-0310, Gulf of Mexico, off Iberia Parish. IP 5,060 M.c.f.d., 44 BCPD, adjustable choke, 46.5°, TP 3,000 psi., perf. 8,506-16 ft. TD 12,866 ft. New offshore field—Mound Point.

The Texas Co. 1 State Lease 340-Mound Point, Gulf of Mexico. IP 5,400 M.c.f.d., 96 BCPD, 20/64-in., 49.4°, TD 4,200 psi., perf. 10,906-20 ft. TD 13,385 ft. Second well and new pay Mound Point field.

The Texas Co. 1 State Lease 340-Tiger

Shoal-OCS-0310, Gulf of Mexico, off Iberia Parish. IP 2,960 M.c.f.d., 32 BCPD, 12/64-in., 33.6°, TP 3,350 psi., perf. 8,954-70 ft. TD 12,395 ft. New field—Tiger Shoal.

MISSISSIPPI

Adams County: Cameron Operating Co. and J. S. Callon 1-A Nan Foster, 4-7n-1w. IP 101 BOPD, 9/64-in., 40°, TP 320 psi., perf. 5,707-12 ft., Wilcox-Foster sand. TD 5,900 ft. Elev. 263 ft., Wilcox 3,918 ft., base Baker shale 5,775 ft. New field.

Franklin County: Serio-Punches Oil Co. 1 Anderson-Cobb, 29-5n-1e. IPP 76 BOPD (net), 38 BWPD, 38°. perf. 6,449½-50½ ft., Wilcox. TD 6,659 ft. Elev. 147 ft., Wilcox 4,500 ft., base Baker shale 6,285 ft. Extends Flat Rock field.

Pike County: Larco Drilling Co. and Dave Gammill 1 Nine Ostarly, 21-4n-7e. IP 188 BOPD (12-hour test), 10/64-in., 38°, GOR 400 cu. ft. per barrel. TP 730 psi., perf. 10,928-34 ft., Lower Tuscaloosa. TD 11,220 ft. Elev. 479 ft., Wilcox 4,365 ft., Marine Tuscaloosa 10,552 ft., Lower Cretaceous 11,180 ft. New field.

NEW MEXICO

Eddy County: Curtis Hankamer 1 Gulf-Federal, 13-26s-29e. IP 37 BOPD, 12/64-in. choke, 3,210-16 ft. TD 3,266 ft. Elev. 2,976 ft.

SOUTHWEST TEXAS

Duval County: Gorman-Delange 2 Gray Ranch, Sec. 560, SK&K Sur., 13 miles northeast of Freer. AOF 1,320 M.c.f.d., dry gas, shut-in pressure 630 psi., perf. 2,773-79 ft., and AOF 890 M.c.f.d., dry gas, shut-in pressure 655 psi., perf. 2,429-35 ft. TD 2,800 ft. New field—Farmers Life.

Humble Oil & Refining Co. 1-B James F. Welder heirs, Sec. 213, J. Poitevent Sur., A-923, 6 miles northeast of Freer. AOF 6,300 M.c.f.d., GLR 48.4 M.c.f. per barrel, 61.1°, shut-in pressure 2,195 psi., perf. 6,300-10 ft., and 16 M.M.c.f.d. GLR 48.8 M.c.f.d., 60.4°, shut-in pressure 2,201 psi., perf. 6,246-58 ft., Queen City, TD 12,350 ft. New field—Northeast Loma Novia.

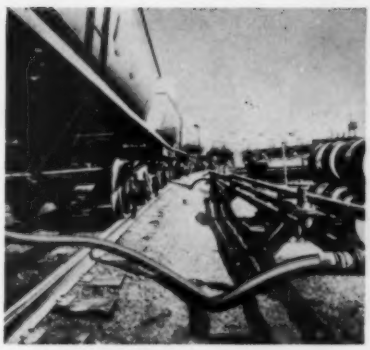
G. L. Rowsey et al. 1-B Elizabeth Allen Parr et al., E. H. Valentine Sur., A-620, 10 miles northwest of San Diego. AOF 335 M.c.f.d., dry gas, shut-in TP 566 psi., perf. 1,493-97 ft. TD 3,358 ft. New pay in Thomas Lockhart field and ½ mile southeast of Blanchard gas field.

McMullen County: The Texas Co. 6 Gouger NCT-2, Sec. 103, BS&F Sur., A-137, 11 miles northwest of Penitas. IPP 80.5 BOPD, 20.3°, perf. 2,225-34 ft. Jackson-Chernosky sand. TD 2,663 ft. New pay in South Campana field.

San Patricio County: Carrl Oil Co. 1 Dubose, Lot 4, Sec. 62, Fifth Addition of Taft Farm Lands, 7½ miles northeast of Taft. IP 233.13 BOPD, 10/64-in., 32°, GOR 50 cu. ft. per barrel, TP 750 psi., perf. 9,378-80 ft., Frio. TD 9,380 ft. New field—West Harvey.

Zapata County: Katz Oil Co. 1-B Antonio M. Vela et al., Lot 38, Foster Subd., Share 2, El Grullo Grant, 12 miles east of Zapata. IPP 25.18 BOPD, 23.2°, GOR 200 cu. ft. per barrel, perf. 2,865-96 ft., upper Queen City, TD 3,023 ft. New field—Herlinda Vela.

W. H. Doran, Jr., 1 Robert Hinnant, Sec. 74, SK&K Sur., 7 miles north of Escobas. IPP 19.15 BOPD, 20.1°, perf. 1,577-79 ft., Pettus. TD 1,608 ft. New



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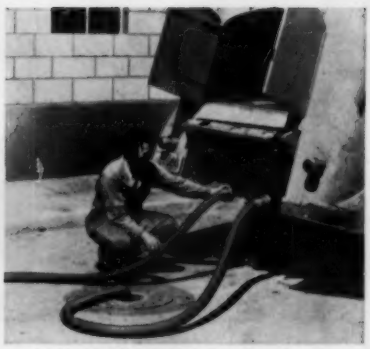

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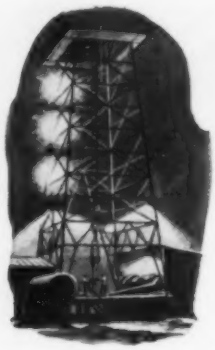

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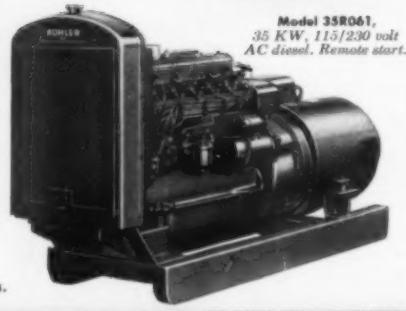

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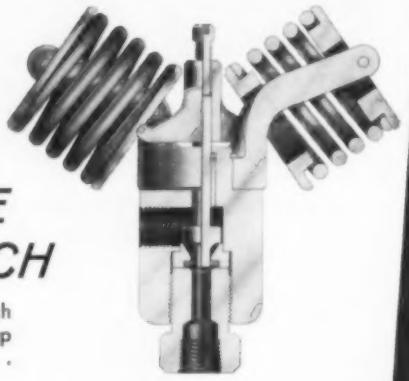

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TEXAS GULF COAST

Chambers County: Dan J. Harrison et al., 1 McNeir, Washington Clary Sur., A-71, 16 miles southwest of Anahuac. AOF 8 M.M.c.f.d., GLR 17.8 M.c.f. per bbl., 53.7°, shut-in. TP 9,435 psi., perf. 12,943-64 ft., lower Frio. TD 14,250 ft. New gas-condensate pay in Smith Point field.

Colorado County: Robert Mosbacher and W. T. Mendell 1 Chumner et al., GH&H Sur., A-252, 4 miles northeast of Eagle Lake. Shut-in gas well, no gage, perf. 9,014-23 ft., Wilcox. TD 9,307 ft. Extension and new pay ¾ mile northeast of West Chesterville field.

Tex-Star Oil & Gas Corp. 1 Boettcher, Micah Andrews Sur., A-64, 7 miles northwest of Rock Island. Shut-in dual zone gas-condensate well, no gages, perf. 8,874-84 ft. and 8,131-38 ft. TD 9,020 ft. Opens new reservoir 1 mile northeast of East Shimek field.

Goliad County: A. B. Alkek 1-B Sol Parks, Manuel de la Pena Grant, A-31. AOF 10,200 M.c.f.d., dry gas, shut-in TP 1,141 psi., perf. 3,547-49 ft., Frio. TD 4,305 ft. New pay in West Fannin field.

Harris County: Geode Petroleum, Inc., 1 Hibbert Unit, W. K. Hamblen Sur., A-317, 1 mile northwest of Fairbanks. AOF 9,600 M.c.f.d., GLR 50 M.c.f. per bbl., 50°, shut-in TP 2,234 psi., perf. 7,451-57 ft. TD 7,800 ft. New pay in Fairbanks field.

Jackson County: Ada Oil Co. 1 Sohio-State Tract 235, Carancahua Bay, 9 miles southeast of LaWard. IP 272.22 BOPD, 10/64-in., 41.3°, TP 1,250 psi., GOR 788 cu. ft. per barrel, perf. 8,558-60 ft. and 8,563-66 ft. TD 8,782 ft. New pay in North Appling field.

Texkan Oil Co. 1 Nyegaard Unit, W. D. Sutherland Sur., A-76, 2½ miles east of Ganada. AOF 196,000 M.c.f.d., GLR 250 M.c.f. per bbl., 56°, shut-in TP 2,110 psi., perf. 5,330-38 ft., Frio. TD 5,412 ft. New field.

Kleberg County: Katz Oil Co. 1 Jesse Dennett, Sec. 38, Kleberg Town & Improvement Co., 11 miles southeast of Kingsville. IP 37 BOPD, 7/64-in., 38°, TP 900 psi., GOR 6 M.c.f. per barrel, perf. 6,156-68 ft., Frio. TD 7,679 ft. New pay and extension in Kingsville field area.

Humble Oil & Refining Co. 6 King Ranch Alazan, Alazan Pasture, Las Comitas Grant, 12 miles southwest of Chapman Ranch. IP 281.19 BOPD. $\frac{7}{16}$-in., 39.4°, GOR 829 cu. ft. per barrel, TD 1,150 psi., perf. 7,220-30 ft., and shut-in gas well, no gage, perf. 7,080-90 ft. TD 8,938 ft. New field—North Alazan.

Matagorda County: Tennessee Gas Transmission Co. 1 Ramsey, W. H. Ramsey Sur., 16 miles southwest of Bay City. IP 277 BOPD, 12/64-in., 34.7°, GOR 1,038 cu. ft. per barrel, TP 2,025 psi., perf. 9,054-58 ft., Frio-Melbourn "E-4" sand, and 270 BOPD, 10/64-in., 38°, GOR 922 cu. ft. per barrel, TP 1,075 psi., perf. 9,003-06 ft. and 9,014-18 ft., Frio-Melbourne sand. TD 9,138 ft. New pays in Palacios north extension area.

Newton County: Sunray Mid-Continent Oil Co. 1 Hankamer, HT&B Sur. 33, 7½ miles northwest of Deweyville. IP 135 BOPD, 11/64-in., 46.4°, GOR 915 cu. ft. per barrel, TP 550 psi., perf. 8,970-80 ft., Yegua Y-11 sand. TD 9,004 ft. New field—Cypress Creek.

Tyler County: Oil Reserves Corp. 8 Kirby-

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December footage analysis

	FIELD WELLS					WILDCAT WELLS			
	Oil	Cond.	Gas	Dry	Service	Oil	Cond.	Gas	Dry
Alabama	22,977	.....	.....	.....	.....	.....	.....	.....	19,660
Arkansas	171,741	.....	13,200	64,145	1,500	8,610	8,271	.....	57,627
California	245,738	.....	18,593	34,800	7,986	13,057	.....	14,639	138,250
Colorado	30,433	5,450	27,862	83,204	.....	28,617	.....	12,701	119,087
Florida	.....	.....	.....	.....	.....	.....	.....	.....	11,898
Idaho	.....	.....	.....	.....	.....	.....	.....	.....	3,003
Illinois	194,882	.....	1,345	176,252	83,429	3,434	.....	795	36,210
Indiana	51,581	.....	880	60,421	.....	5,672	.....	.....	22,523
Kansas	453,116	16,737	43,770	333,713	28,272	47,914	.....	16,432	216,534
Kentucky	160,833	.....	4,769	138,206	.....	1,416	.....	.....	21,136
Louisiana	1,098,421	274,294	64,050	560,627	6,020	46,323	62,011	9,676	407,710
North	201,090	.....	32,985	85,417	.....	12,489	.....	9,676	147,289
South	756,103	217,051	23,258	389,626	2,600	33,834	24,515	.....	260,421
Offshore	141,228	57,233	7,807	85,584	3,420	.....	37,496	.....	.....
Michigan	30,000	.....	10,775	12,000	.....	2,101	.....	2,796	45,603
Mississippi	110,482	9,556	4,796	27,507	.....	16,860	.....	.....	130,878
Montana	61,006	.....	.....	32,877	.....	27,054	.....	3,375	50,922
Nebraska	64,405	.....	.....	73,436	.....	18,547	.....	.....	145,324
New Mexico	317,424	13,516	65,942	17,632	.....	7,563	6,370	.....	87,483
New York	27,050	.....	.....	.....	27,050	.....	.....	.....	.....
North Dakota	68,395	.....	.....	34,215	.....	.....	.....	.....	20,375
Ohio	133,824	.....	63,627	52,836	13,646	3,446	.....	.....	8,806
Oklahoma	923,300	29,578	191,930	518,034	40,679	56,953	8,540	18,394	150,894
Pennsylvania	33,298	.....	100,091	63,700	20,512	.....	.....	21,771	17,769
South Dakota	.....	.....	.....	.....	.....	8,645	.....	.....	2,654
Tennessee	.....	.....	.....	.....	.....	.....	.....	.....	932
Texas	3,080,530	511,330	255,047	1,038,718	103,341	112,022	82,028	42,850	1,194,700
Dist. 1	89,559	38,845	15,186	52,192	.....	.....	.....	.....	58,795
Dist. 2	66,234	61,302	21,560	46,549	.....	.....	9,220	.....	95,125
Dist. 3	382,555	163,713	12,557	236,447	23,201	25,657	19,690	.....	111,817
Dist. 4	80,735	87,833	15,481	79,843	47,945	3,023	.....	17,330	180,501
East	216,859	67,883	.....	88,154	.....	1,632	33,788	.....	125,657
Dist. 7-B	308,638	5,165	12,915	185,416	7,358	10,125	.....	.....	187,036
West	1,461,387	65,138	37,841	160,633	4,592	29,830	11,930	19,020	225,174
Dist. 9	244,555	.....	42,619	136,341	16,997	34,090	.....	6,500	147,925
Dist. 10	230,008	21,451	96,888	53,143	3,248	7,665	7,400	.....	62,670
Utah	69,193	.....	.....	28,921	.....	.....	.....	.....	42,635
West Virginia	5,639	.....	101,447	2,800	6,165	.....	.....	22,819	.....
Wyoming	102,216	.....	25,819	66,724	.....	17,087	.....	7,750	136,499
Total United States	**7,456,484**	**860,451**	**993,943**	**3,420,768**	**338,600**	**425,321**	**167,220**	**173,998**	**3,089,112**

McInnis, J. R. McInnis Sur., A-1,030. IP 270.32 BOPD, 11/64-in., GOR 1,705 cu. ft. per barrel, TD 1,425 psi., perf. 8,503-12 ft. Wilcox. TD 8,600 ft. New pay in Theuvenins Creek field.

TEXAS PANHANDLE

Roberts County: El Paso Natural Gas Co. 1 Mitchell, northeastern corner of county, 11 miles northwest of Canadian, 2 miles southeast of Parsell gas field, Sec. 141, Blk. 42, H&TC Sur. IPF 676 BOPD, 41°, upper Morrow sand 9,914-40 ft.; IPF 2,830 M.c.f.d. of gas, and 41 bbl. condensate per million, 47°, lower Morrow sand 10,004-14 ft. TD 11,443 ft. New oil and gas-condensate discovery.

WEST CENTRAL TEXAS

Coleman County: Walter H. Pape, Jr., 1 Duane Holt, A. Fisk Sur. 630, 3 miles southeast of Santa Anna. IP 240 BOPD, 20/64-in. choke, 30°, GOR 500:1, TP 120 psi. pay 2,315 ft. TD 2,390 ft.

Stonewall County: Allison, Prestridge and Sunray Mid-Continent Oil Co. 1 Freeman, Sec. 221, Blk. D, H&TC Sur., 5 miles north of Swenson, IPP 39 BOPD, 40°. GOR 180:1, Tannehill sand 3,216-21 ft. TD 6,500 ft. Elev. 1,815 ft. New pay in Mullen Ranch (Ellenburger) field.

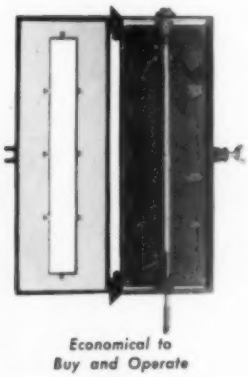
Taylor County: West Central Drilling Co. 1-4 Edgar Davis, Sec. 4, Blk. 5, T&P Sur., 12 miles south of Merkel. IPP 40 BOPD, 40°, GOR 600:1, pay 4,614-18 ft., TD 5,464 ft. Elev. 2,314 ft.

Throckmorton County: Clark & Cowden 1 T. G. Hendrick estate, Sec. 11, Brooks & Burleson Sur., M-5, 22 miles northwest of Albany. IPP 14.5 BOPD, 39°, GOR 320:1, Bend conglomerate 4,882-86 ft. TD 4,930 ft.

A NEW AND BETTER
LIQUID LEVEL CONTROLLER

For controlling high and low levels in a variety of tank operations. *Especially ideal for surge tanks on lease automatic custody transfer units.* Easy to install . . . fully automatic . . . maintenance-free!

PHIL-MAG



Economical to Buy and Operate

WRITE FOR DESCRIPTIVE LITERATURE

Enardo Manufacturing Company BOX 1647 TULSA

December wildcat depth breakdown

	OIL DISCOVERIES									GAS STRIKES									DRY HOLES								
	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I
Alabama	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	2	...	...	...
Arkansas	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	2	4	1	3	2	...	...	...
California	...	...	1	...	...	...	1	...	...	...	...	1	...	...	...	1	...	...	2	4	3	3	7	1	5	...	...
Colorado	...	...	...	...	5	...	...	...	...	...	...	...	...	2	...	...	...	...	1	...	...	4	16	1	...	...	...
Florida	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Idaho	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Illinois	...	...	1	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	10	11	3	...	...	...	...	...	...
Indiana	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	10	...	...	...	...	...	...	...
Kansas	...	...	5	6	1	...	...	...	...	...	...	...	1	2	...	...	...	...	...	7	23	19	8	...	...	...	...
Kentucky	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	10	...	...	...	...	...	...	...
Louisiana	...	...	...	...	2	1	...	2	...	...	...	...	...	...	1	...	...	...	...	...	14	4	13	4	11	3	4
North	...	...	...	...	2	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	14	4	12	1	...	...	...
South	...	...	...	...	...	1	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	3	11	3	4
Offshore	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Michigan	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	4	5	2	...	...	...	...	...
Mississippi	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	2	6	2	...
Montana	...	...	...	...	1	1	1	...	...	...	...	1	...	...	...	...	...	...	1	2	4	1	5	...	...	...	...
Nebraska	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	6	18	...	...	...	...
New Mexico	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	7	1	...	6	...	3	...	...
North Dakota	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2	...	...	1	...	...	...
Ohio	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...
Oklahoma	...	...	...	...	6	1	1	...	...	...	1	...	...	1	...	1	...	...	19	9	7	9	7	1	1	...	...
Pennsylvania	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	2	...	...	...
South Dakota	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...
Tennessee	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Texas	...	2	3	8	4	5	...	...	...	...	1	...	...	2	1	...	...	1	32	47	46	51	55	31	9	2	...
Dist. 1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9	5	3	1	3	1	...	...	...
Dist. 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	6	5	1	...	...
Dist. 3	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	3	7	2	...	...
Dist. 4	...	...	1	...	...	...	...	...	...	...	1	...	...	1	1	...	...	...	2	...	6	6	10	7	1	1	...
East	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	4	3	3	8	5	1	...	...
Dist. 7-B	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	10	24	11	9	9	...	...	...	...
West	...	1	1	4	...	1	...	...	...	...	...	...	...	...	...	...	...	1	6	9	14	15	7	1	3	1	...
Dist. 9	...	...	1	3	3	...	...	...	...	...	...	...	...	1	...	...	...	...	2	5	7	14	9	...	...	...	...
Dist. 10	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	5	1	...	...
Utah	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	4	1	...	...	...
West Virginia	...	...	...	...	...	...	...	...	...	...	...	...	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...
Wyoming	...	...	...	...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	2	2	2	1	10	4	2	...	...
Total United States	**1**	**5**	**13**	**15**	**24**	**10**	**5**	**2**	...	**2**	**2**	**3**	**2**	**14**	**3**	**2**	...	**1**	**80**	**118**	**116**	**106**	**155**	**52**	**38**	**7**	**4**

NOTE: A = 0-1,250 ft.; B = 1,250-2,500 ft.; C = 2,500-3,750 ft.; D = 3,750-5,000 ft.; E = 5,000-7,500 ft.; F = 7,500-10,000 ft.; G = 10,000-12,500 ft.; H = 12,500-15,000 ft.; I = 15,000 ft.

December field-well depth breakdown

	OIL WELLS									GAS WELLS									DRY HOLES								
	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I
Alabama							2																				
Arkansas	2	47	11	4		1						2		1						1	10	2	1	2			
California	6	15	7	11	6	4	4	2					1	1	1				1	2	2		2		1		
Colorado		1	2	1	3								1	4					2			5	10				
Illinois	23	30	38							2									16	20	40						
Indiana	10	18	5	1						1									6	23	2						
Kansas		39	71	31	1							4	5	2						11	60	28	1				
Kentucky	189	23	9							1	2								162	17	7						
Louisiana	13	41	15	6	16	34	24	16	4	2	7	2			2	1	1		5	8	9	5	7	10	17	9	3
North	8	37	12	4	6	3	1			2	7	2				1			1	6	6	3	4	1	1		
South	5	4	3	2	8	23	19	15	4						1		1		4	2	3	2		7	13	8	3
Offshore					2	8	4	1							1								3	2	3	1	
Michigan		7	6	1							4		1							4							
Mississippi				1	3	1	7						1									1	2		1		
Montana		3	3		5	2														1	5	1	2				
Nebraska			1		10															1	1	2	10				
New Mexico	1	24	15	16	9	4	3	3			2	4	3	3	1		1		2	1	1	1	1				
New York		21																									
North Dakota			7		1	3	1														2		3	1			
Ohio	6	4	35	1						3	7	11	3						9	4	7	3					
Oklahoma	43	78	112	27	30	13				2	3	3	5	19	4				40	37	34	20	21	6	5		
Pennsylvania		19										32								3	6	3					
Texas	92	143	234	124	132	60	10	2		1	20	18	4	15	3	1	1		57	89	57	45	42	18	2	2	
Dist. 1	22	18	8	2	1						1	1				1			4	12	4	3					
Dist. 2			3		8	1						1	1	1	1							3	1	3			
Dist. 3	4	1	11	6	20	20	1					1	1	1					9	5	4	3	10	11	2	1	
Dist. 4		2	10	1	6	1				1	4			1					1	3	2	3	9				
East	6	2	14	6	16	4														2	1	4	9	1			
Dist. 7-B	25	46	13	28	8						3	1		1					25	25	14	13	4				
West	3	21	130	68	60	25	8	2			1		1	3			1		3	6	11	13	5	2		1	
Dist. 9	32	49	7	13	11									7					15	34	13	3	2				
Dist. 10		4	38		2	9	1				11	14	1	1	2					2	8		2	1			
Utah					12																		5				
West Virginia		3									26	6	7	1							1						
Wyoming	6	3	5	10	5										3				5	2	6	3	4				
Total United States	**391**	**519**	**576**	**234**	**233**	**122**	**51**	**23**	**4**	**12**	**71**	**82**	**31**	**46**	**14**	**2**	**3**	...	**305**	**224**	**250**	**119**	**111**	**37**	**26**	**11**	**3**

NOTE: A = 0-1,250 ft.; B = 1,250-2,500 ft.; C = 2,500-3,750 ft.; D = 3,750-5,000 ft.; E = 5,000-7,500 ft.; F = 7,500-10,000 ft.; G = 10,000-12,500 ft.; H = 12,500-15,000 ft.; I = 15,000 ft.

(More exploration news on page 336)

SAE Is Headed by Oil Man

. . . for third time in 53 years. Choice of Socony scientist reflects the closer ties between oil and auto industries.

ONLY TWICE in more than a half century had the Society of Automotive Engineers chosen an oil man for president.

But this year marks the third time. The top SAE post goes to Leonard Raymond, chief automotive engineer for research, Socony Mobil Oil Co., Inc., who started in the oil business as a research chemist in 1928.

The SAE's action wasn't as revolutionary as it sounds, because in the past 30 years Raymond has been working with fuels and lubricants and their application to Detroit's products.

Also, the choice of an oil man reflects current thinking among auto people. There has been a growing awareness that the design of automobile engines is inherently wedded to fuel quality, and limiting factors in the latter play their part in what type of car hits the road in the future.

Such has not always been the case. Not too many years back, fuel quality and availability were the least of Detroit's worries. This was reflected in a few designs which moved a little too far and too fast for the current fuels.

Generally, research people in the auto world have been aware of the close relationship between fuels, lubricants, and vehicles. Manufacturers, however, have been a bit slower in recognizing the importance of these ingredients in the over-all design.

Exchanging ideas . . . Part of Raymond's job during the years has been to convey the oil man's attitude to the auto industry and in turn to bring the automobile manufacturer's thinking to the refiner.

Leonard Raymond
. . . more than a one-sided view.

He doesn't deny that his close association with Detroit has affected his thinking. It was bound to, and it's a good thing, he feels. The whole object of his work has been to exchange ideas.

The goal is the most economical compromise between the industries which will benefit the mutual customers of both. This thesis requires more than a one-sided viewpoint.

While most of his career has been spent in laboratory work, with both The Texas Co. and Tidewater Oil Co. before joining Socony, Raymond says perhaps his most rewarding experience was a 5-year tour of duty with the marketing department.

He thinks more research people should do it. There is a big gap between the researcher and the consumer at the service-station pump. The customer's reactions are generally highly diluted before they filter back to the lab group. Learning marketing problems is all-important for the company, he believes, because a product is no good unless it sells.

Uncertain future . . . The future for the refiner is a big question mark sprinkled with many problems, Raymond feels.

The industry is at a turning point. Where to go and how to get there are real stumpers. Hundreds of millions of dollars, maybe billions, are riding on the ultimate ceiling on octane numbers. It would take a lot of spending to attain some of the indicated heights. This, however, is only part of the future.

The erratic combustion of fuels as associated with high-compression engines poses perhaps the biggest headache, at least from the technological standpoint.

Octanes alone are not just the answer for preignition, wild ping, rumble, and other problems. These combustion problems can lead to costly mechanical failures. Hence, a tremendous research effort is being expanded in both industries to find an answer to surface ignition effects.

The new SAE president, who received his master's degree at Columbia University in 1928, know the industries' problems well. He has been chairman and member of many Coordinating Research Council committees and subcommittees dealing with fuels, lubricants, and equipment.

He has also served on various committees of API and American Society for Testing Materials. He is a member of American Chemical Society of Mechanical Engineers.

What's his answer to the almost-perennial question on the outlook for gas turbines? "I'll be retiring in 10 years, and I don't think I'll see them in automobiles by then."

▶ ▶ ▶ Personals

Aaron Wachter, director of research for Shell Development Corp., has received the 1958 Frank Newman Speller award of National Association of Corrosion Engineers. The award recognizes achievement in corrosion engineering. Wachter was 1954 president of NACE. He has been head of Shell Development's corrosion department since 1938.

A. P. McGuire, assistant manager of Stauffer Chemical Co.'s Louisville, Ky., plant, has been named manager of American Chemical Corp.'s Watson, Calif., plant, now under construction. American Chemical is a subsidiary of Stauffer Chemical and Richfield Oil Corp. McGuire will supervise construction at Watson and will build an operating organization before plant production begins. The plant is expected to go on stream in January 1960.

Charles M. Wanner, formerly a consulting geologist, has joined Drilling & Exploration Co., Inc., Dallas, as assistant to the manager of Eastern Hemisphere operations.

Frank Perkins, Jr., Schlumberger Well Surveying Corp., Lubbock, Tex., has been named chairman of the Southwestern Federation of Geological Societies. Perkins succeeds **William J. Wilson,** Shell Oil Co., first president of the society, which was founded last year. Other officers for 1959 are **W. E. Bivens, Jr.,** San Antonio, Tex., independent geologist, vice chairman; **Lewis Williams,** Sun Oil Co., secretary; and **Clayton Val-**

Williams New President of Well-Servicing Contractors

These new officers took over the reins of the fast-growing Association of Oilwell Servicing Contractors for 1959 following the association's third annual convention in Dallas January 16-17. From left, they are: Jimmy W. Wilkins, D & G Drilling Co., Andrews, Tex., second vice president; Leo L. Kent, Kent Oil Field Service, Inc., El Dorado, Kans, first vice president; and J. C. Williams, Jr., Williams Well Service, Springhill, La., president. Not in photo is Barney Foster, F & F Well Service, Odessa, Tex., treasurer.

der, Pan American Petroleum Corp., treasurer.

Don W. Detjen has beeen named executive assistant to the management of Valvoline Oil Co., Freedom, Pa., a division of Ashland Oil & Refining Co. Detjen has been with Ashland since 1948.

FAIRCHILD

Paul Fairchild, Denver area geologist for Shell Oil Co., has been named exploration manager of a new office in Pittsburgh. **Harry Walley,** area land agent in Denver, has been moved to Pittsburgh as division land manager. **C. L. Jenks,** geologist, also moves from Denver to Pittsburgh. Moving from Evansville to Pittsburgh are **T. P. McCann,** district geologist; **F. H. Jacobeen, M. C. Noger,** and **C. J. Slagle,** geologists. Shell has also opened an office in Fort Smith, Ark., to handle northwestern Arkansas activity. **J. W. Wilcox,** head of the unitization and pooling section of the Tulsa land department, has been named district land agent in Fort Smith. **R. W. Forster,** geologist, moves there from Oklahoma City. **C. J. Cerny,** Amarillo, Tex., exploitation engineer; **E. W. Triplett,** Elk City, Okla., drilling foreman; and **Leonard Vaughn,** Amarillo scout, have also been assigned to Fort Smith.

John A. Pederson, district exploitation engineer in Shell Oil Co.'s Billings, Mont., division, has been named reservoir engineer in the Denver area office. **Robert L. Spottswood,** exploitation engineer, has been named reservoir engineer in Billings. **John A. Ihli,** exploitation engineer, has been named production geologist, Billings division. Also, **Gerald L. Thompson** and **James F. Bade,** exploitation engineers, have been appointed petrophysical engineers, Billings division.

Hal T. Gibson, Tulsa attorney has been appointed manager of the Oklahoma Independent Petroleum Association. He succeeds **Max Genet, Jr.,** who recently resigned to become director of the Oklahoma department of commerce and industry. Gibson was formerly a special attorney in the U. S. Department of Justice, Tulsa.

Victor H. King, who earlier this month was elected director in charge of exploration for General Petroleum Corp., will resign this job to become exploration manager for Mobil International Oil Co., overseas operating division of Socony Mobil Oil Co. General Petroleum is the West Coast affiliate of Socony. **Geoffrey R. Lucie-Smith,** assistant general manager of Libyan operations for Mobil Oil Co. of Canada, Ltd., has been named producing manager for Mobil International. **William E. Lindenmuth,** attorney for Socony, has been named Middle East regional executive for Mobil International.

C. C. Herndon, Jr., has joined Skelly Oil Co. as staff geologist in Midland, Tex.

H. G. Henderson, petroleum engineer with The California Co. in Salt Lake City, has joined the Utah Oil and Gas Conservation Commission as engineer in Moab, Utah.

Richard M. Goddard, sales manager of American Cyanamid Co.'s process chemicals department, has been promoted to manager, process chemicals department.

W. T. Crowder, district manager of Lufkin Foundry & Machine Co.'s East Texas area, is the new chairman of the East Texas section of AIME's Society of Petroleum Engineers. Other officers are **Hugh Barton,** Humble Oil & Refining Co., vice chairman; and **J. J. Bresenham,** Magnolia Petroleum Co., program chairman.

FOSS

HARDER

DOUMA

R. E. Foss and **H. O. Harder,** vice presidents of Sunray Mid-Continent Oil Co., have been named senior vice presidents. Foss is in charge of production and Harder, in charge of exploration. Foss and Harder were elected directors of the company last May. **John H. Douma,** manager of joint operations for Sunray in Tulsa, has been named vice president and manager of the West Coast division in Los Angeles. He succeeds **F. W. (Dick) Borden,** who has resigned. Douma joined the company in 1938 in the California division. He was transferred to the Tulsa general offices in 1946. He has served as general superintendent, manager of engineering services and manager of joint operations since that time. **Robert W. Griffith,** special production department assistant to Foss, has been named manager of the joint operations division, succeeding Douma. Griffith joined the company in 1948. He was manager of the gas-gasoline division before becoming special assistant to Foss.

HARDIN

George C. Hardin, Jr., exploration and production manager for Michel T. Halbouty, Houston independent, and executive vice president of Halbouty Alaska Oil Co., has been elected president of the Gulf Coast Association of Geological Societies. Other officers are **Lyle H. Harvey,** New Orleans office of John W. Mecom; vice president; **Weldon C. Henkhaus,** Arkansas Fuel Oil Corp., secretary; and **James A. Wheeler,** Houston consultant, treasurer. The Gulf Coast Association is a federation of 11 local geological societies.

Alirio Parra, assistant petroleum counselor to **Dr. Carlos Perez de la Cova** in the Venezuelan embassy in Washington, is returning to Caracas where he will be named to a new post in the ministry of mines and hydrocarbons. He is being succeeded in Washington by **Antonio Casas Gonzales.**

ALTHOUSE

Raymond L. Althouse, former president of Royalite Oil Co., Ltd., has joined Ashland Oil & Refining Co. as manager of exploration and production. Althouse succeeds **Edward Emrick,** who is also assistant treasurer of the company. Emrick is scheduled to become treasurer when **Edward W. Seaton** retires later this year. Seaton will continue as a director of the company.

B. C. Jones, chief geologist of Canadian Superior Oil of California, Ltd., has been named exploration manager.

Dr. Philip W. Reinhart, acting coordinator of the special studies group in Shell Oil Co.'s Denver area, will retire February 1. Reinhart was division exploration manager for Shell in Casper, Wyo., before moving to Denver in 1955 as area geologist. He has held his present post since 1956.

R. A. B. Clough will replace **Dr. J. R. Dominguez** as general superintendent of Shell de Venezuela's La Concepcion district. Dominguez is scheduled to be named manager for development of personnel in Caracas. **D. Dosei,** manager of exploitation and production in the western division, will succeed **Dr. E. W. Clark,** who is retiring as manager of production at Caracas later this year. **R. A. Henkes,** director of organization and controls, has been named long-range planning manager. He succeeds **W. J. Baan,** who has retired after 32 years in Venezuela.

John F. Merriam, president of Northern Natural Gas Co., has been elected president of Helex Co., newly formed subsidiary of Northern Natural and Air Products, Inc. Helex will build a helium plant near Sunray, Tex. (OGJ, Jan. 19, p. 62). Other officers will be **M. L. Mead,** senior vice president; **F. C. Nicholson,** vice president; **W. H. Thomas,** vice president sales; **B. H. Harper,** secretary; and **H. H. Siert,** treasurer. Thomas is with Air Products, the others with Northern Natural. Directors of Helex are Merriam, Mead, **A. B. Dilworth,** Northern Natural, and **Leonard Pool,** and **Edward Donley** of Air Products.

▶▶▶ Personals

R. L. Sielaff, Rocky Mountain division exploration manager for Tennessee Gas Transmission Co., has been named division manager in charge of both exploration and production. **R. M. Stephens,** formerly district production superintendent in Bellaire, Tex., has been transferred to the Rocky Mountain division as production superintendent. **J. M. Wolfe,** assistant division exploration superintendent in Denver, moves up to superintendent.

HEISS

Henry A. Heiss, formerly manager of American Oil Co.'s Destrehan, La., refinery, has been named manager of the El Dorado, Ark., refinery. He succeeds **J. M. Brown,** who has retired after 33 years with the company. In other changes, **R. L. Argus,** assistant manager at Destrehan, has been transferred to Texas City as assistant manager there. **F. K. Webb,** formerly assistant manager at Texas City, has moved to Yorktown, Va., in the same capacity. He succeeds **B. V. Tunnell,** who has moved to Texas City as an assistant manager. **Edwin S. Chelchowski,** process superintendent at Destrehan, has been named operating superintendent of the El Dorado refinery. Heiss, new manager at El Dorado, joined Standard Oil Co. (Ind.), Amoco's parent company, in 1937. He had been manager at Destrehan since 1951. The Destrehan refinery was closed late in 1958.

▶▶▶ Deaths

Ernest Collenburg, 56, assistant to the director of American Petroleum Institute's department of statistics, died January 13 of a heart attack. He had been with API more than 30 years.

Andrew B. Heckard, 83, retired construction engineer for Atlantic Refining Co., died January 16 in Franklin, Pa.

John Timothy Mullen, Jr., 52, senior geologist in the oil development department of Northern Pacific Railroad, died recently in Billings, Mont. Mullen joined the railroad soon after graduation from the University of Minnesota in 1929.

John R. Hickman, 47, district superintendent at Boise, Idaho, for Pacific Northwest Pipeline Corp., died January 11 in Boise.

Elmer F. Schmidt, 69, retired senior vice president of Lone Star Gas Co., died January 15 in Dallas. Schmidt began his career with Ohio Fuel Supply Co. in Charleston, W. Va. While with that firm, he helped develop an instrument to determine specific gravity of gas and others to measure gas volumes. He joined Lone Star in 1918. He was named senior vice president in 1954 and retired later that year to set up shop as a consultant. Under his direction, Lone Star acquired patents for the manufacture and use of inert flue gas in repressuring oil fields, for removal of sulfur from natural gas containing oxygen, for a vaporizer for butane and propane use, and for a gas cleaner now used universally by gas pipelines. Schmidt received the American Gas Association's award of merit in 1953.

Thomas F. Fine, 68, Kansas independent operator, died January 21 in Wellington, Kans. Fine had been active in Kansas fields since 1922.

Elmer E. Harper, 58, assistant to the superintendent of Sunray Mid-Continent Oil Co.'s power department, died January 21 in a Tulsa hospital.

Shallow wells cut average well depth

BY JOHN C. CASPER

THE AVERAGE WELL in 1958 was drilled to a depth of 4,019 ft., compared with 4,122 ft. in 1957 which was an all-time record.

In general, the average footage drilled per well has been increasing. For the period from 1925 to 1930, average depth was in the range of 2,800 to 2,900 ft. There was no definite indication of a deepening trend during the thirties. Yearly averages ranged from 2,670 ft. in 1934 to 3,116 ft. in 1938 and back to 3,045 ft. in 1940.

A general trend toward deeper drilling began to show in the period of World War II and continued in the postwar period. The average well deepened from 3,045 ft. in 1940 to 3,469 ft. in 1945 and to 3,680 ft. in 1950.

There were sharp increases in average depth for the first few years of the fifties, followed by a period of slowing down. A jump of 100 ft. per well in 1957 seemed to indicate a return to the upward trend, but it was followed by a drop of 103 ft. per well.

There have been good reasons for the abnormal shifts in recent years. But, the low average depth has not been due to decreased drilling in the deeper basins.

The chart on the right below shows the trend for deep-well completions. There has been a steady growth in the percentage of total drilling represented by wells deeper than 10,000 ft.

A quick look at the highlights . . .

	LATEST WEEK	Change from WEEK AGO		Change from YEAR AGO	
Production	7,095,850	UP	34,389	UP	194,420
Crude stocks	260,255,000	DOWN	2,678,000	DOWN	16,342,000
Completions	1,036	DOWN	220	DOWN	82
Refinery runs	8,129,000	DOWN	116,000	UP	454,000
Gasoline stocks	190,748,000	UP	724,000	DOWN	9,888,000
Kerosine stocks	23,235,000	DOWN	2,128,000	DOWN	2,108,000
Distillate stocks	109,656,000	DOWN	9,451,000	DOWN	25,750,000
Residual stocks	59,368,000	DOWN	623,000	UP	1,416,000
Four-product stocks	383,007,000	DOWN	11,478,000	DOWN	36,330,000
Total imports	1,820,900	DOWN	35,800	UP	459,500

For the year 1950, wells drilled below 10,000 ft. accounted for only 2.6% of total well completions. There has been a steady upward trend since that time to the 5.2% position in 1958.

One big factor influencing average footage has been the unpredictable shift in shallow-well drilling. The percentage of total drilling represented by wells under 2,500 ft. is shown by the line on the left chart.

Gains in shallow drilling for 1954, 1955, and 1956 were influenced by fracturing. Shorter payout periods for fractured wells permitted expansion of some of the old shallow areas.

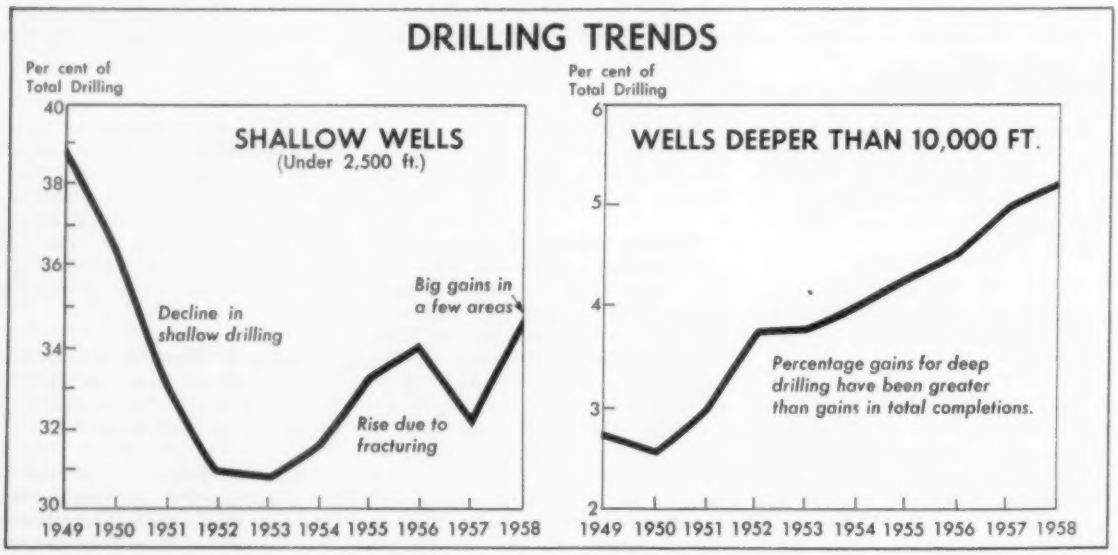
The increase in the shallow-well percentage in 1958 can be credited to big gains in a few areas. Two of these areas were in Kentucky. The outstanding play was in Green County where operators completed over 800 wells with an average depth of less than 450 ft. Also, Muhlenberg County in Kentucky reported 163 completions averaging 1,181 ft. per well.

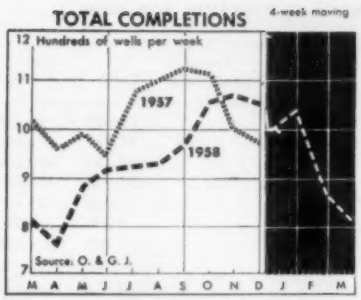
The third play was in Kiowa County, Oklahoma, with 476 wells averaging 618 ft. per well. These three areas account for 1,484 wells but only 860,000 ft. of hole.

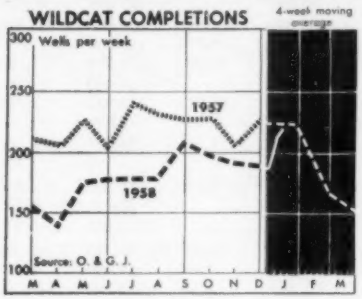
All other wells in this country averaged 4,126 ft. per well in 1958.

Markets

Continuing cold weather is boosting distillate prices in most marketing areas. Residual demand also has been heavy. The reverse is true for gasoline: soft markets with price shading.







Active Rotary Rigs*

	1-19-59	1-12-59	1-20-58
Alabama	9	8	8
Arkansas	11	14	15
Arizona	...	...	1
California	78	88	91
Land	73	83	(†)
Offshore	5	5	(†)
Colorado	23	27	33
Florida	1	1	1
Illinois	44	39	38
Indiana	6	6	5
Iowa	3	3	3
Kansas	118	120	108
Kentucky	7	6	4
Louisiana	317	322	341
North	44	39	36
S.-Inland waters	127	131	(‡)
S.-Land	113	116	231
Offshore	33	36	74
Maryland	2	2	..
Michigan	10	13	6
Missouri	..	..	..
Montana	17	17	29
Mississippi	56	59	47
Nebraska	22	14	20
Nevada	...	...	...
New Mexico	94	97	113
New York	...	...	1
North Dakota	30	32	41
Ohio	3	3	2
Oklahoma	194	200	190
Oregon	...	...	...
Pennsylvania	11	10	8
South Dakota	...	...	1
Texas	678	721	750
S.-Inland waters	3	2	(‡)
S-Land	124	142	153
Offshore	2	2	2
North-East	149	150	(†)
West Central	265	276	(†)
West	135	149	(†)
Utah	30	35	50
Washington	1	1	...
West Virginia	3	3	4
Wyoming	54	61	47
Total U. S.	1,822	1,902	1,957
Western Canada	203	189	208
Eastern Canada	...	...	1
Grand total	2,025	2,091	2,166

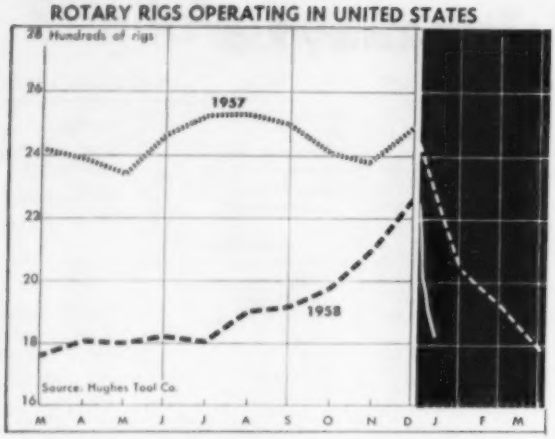
*Hughes Tool Co. †Comparisons not available due to change in method of reporting. ‡Included in South-Land.

WEEKLY WELL COMPLETIONS . . . WEEK ENDED JANUARY 17, 1959

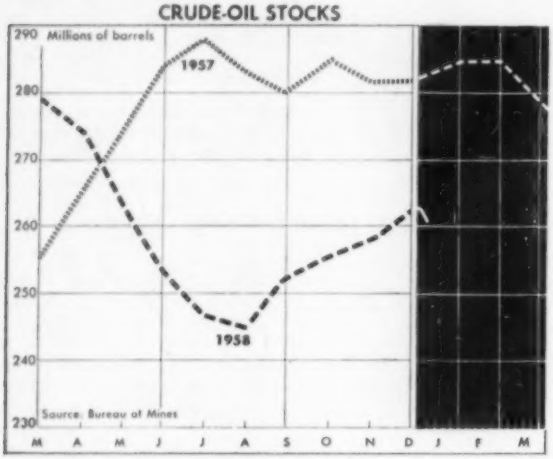
	Total wells							Cum.		Total wildcats					Cum.	
	Total	Crude	Cond.	Gas	Dry	Service	Footage	1959	1958	Total	Crude	Cond.	Gas	Dry	1959	1958
Alabama	3	3	0	0	0	0	34,560	10	6	0	0	0	0	0	2	2
Arkansas	16	6	0	0	10	0	59,278	54	53	7	0	0	0	7	19	9
California	32	22	0	1	9	0	148,073	108	132	9	0	0	1	8	29	21
Colorado	19	3	0	4	11	1	104,138	44	32	11	1	0	2	8	23	12
Illinois	90	36	0	0	35	19	183,159	131	78	15	0	0	0	15	24	24
Indiana	12	8	0	0	3	1	20,237	34	33	1	0	0	0	1	8	8
Kansas	112	49	0	4	57	2	382,304	257	227	33	2	0	1	30	70	57
Kentucky	43	14	0	8	17	4	74,403	93	56	3	0	0	0	3	5	5
Louisiana	50	16	1	4	29	0	465,804	201	187	8	0	0	2	6	33	31
North	8	2	0	3	3	0	50,553	67	53	4	0	0	2	2	18	17
South	34	10	1	1	22	0	334,594	115	107	4	0	0	0	4	14	14
Offshore	8	4	0	0	4	0	80,657	19	27	0	0	0	0	0	1	0
Michigan	9	1	0	1	7	0	27,592	27	17	3	0	0	0	3	7	7
Mississippi	15	8	0	0	7	0	147,929	50	33	8	2	0	0	6	27	17
Montana	3	2	0	0	1	0	17,492	17	28	0	0	0	0	0	5	14
Nebraska	9	3	0	0	6	0	56,709	33	45	3	1	0	0	2	14	22
New Mexico	31	19	0	5	7	0	148,970	86	145	4	0	0	0	4	11	26
New York	5	3	0	0	0	2	7,104	14	35	0	0	0	0	0	1	5
North Dakota	9	5	0	0	4	0	54,339	24	29	4	2	0	0	2	7	13
Ohio	0	0	0	0	0	0	0	22	34	0	0	0	0	0	2	0
Oklahoma	110	59	2	8	40	1	465,657	310	452	20	2	0	1	17	64	76
Pennsylvania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Texas	444	240	17	14	170	3	1,873,082	1,140	1,134	89	6	1	2	80	254	278
Dist. 1	22	13	1	1	7	0	74,364	102	55	5	0	0	1	4	22	21
Dist. 2	10	2	2	2	4	0	63,106	62	47	2	0	0	0	2	17	17
Dist. 3	19	7	3	2	7	0	129,749	73	78	7	1	1	1	4	26	15
Dist. 4	17	5	1	4	7	0	86,394	108	68	4	1	0	0	3	34	29
East	22	3	5	1	13	0	121,454	63	89	5	0	0	0	5	20	30
Dist. 7-B	53	13	1	0	39	0	190,784	126	124	22	0	0	0	22	46	45
West	145	103	2	6	40	0	719,723	321	358	15	1	0	0	14	37	61
Dist. 9	124	69	0	4	48	3	360,272	199	250	27	3	0	0	24	41	50
Dist. 10	32	25	2	0	5	0	127,236	86	65	2	0	0	0	2	11	10
Utah	7	2	0	0	5	0	39,279	14	14	3	0	0	0	3	6	4
West Virginia	4	1	0	1	2	0	8,125	40	31	0	0	0	0	0	1	0
Wyoming	12	5	0	2	5	0	78,389	41	52	4	1	0	2	1	17	22
Misc. (Ariz.)	1	0	0	0	1	0	6,520	6	13	0	0	0	0	0	4	9
Total U. S.	**1,036**	505	20	52	426	33	4,403,143	2,756	2,866	**225**	17	1	11	196	633	662
Prev. week	1,256	606	47	71	513	19	5,728,040	.....	.....	288	25	10	6	247	.....	.....
Cum. 1959	2,756	1,304	68	165	1,148	71	11,877,705	.....	.....	633	62	11	22	538	.....	.....
Western Canada	33	22	0	1	10	0	175,796	33	122	8	1	0	1	6	8	32

PRODUCTION

ROTARY RIGS OPERATING IN UNITED STATES



CRUDE-OIL STOCKS



CRUDE-OIL STOCKS BY STATES OF ORIGIN*

(Thousands of barrels)

	1-10-59	1-3-59	1-11-58
Pennsylvania Grade	2,618	2,585	2,922
Other Appalachian	1,606	1,684	1,618
Illinois, Indiana, Michigan	10,501	10,292	11,554
Nebraska and North Dakota	1,924	2,184	2,351
Kansas	9,724	10,035	9,594
Oklahoma	16,928	17,040	19,257
Arkansas	1,989	2,302	2,723
Louisiana	17,318	17,233	19,836
North	3,096	3,072	3,134
South	14,222	14,161	16,702
Mississippi, Alabama, Florida	2,377	2,482	2,594
New Mexico	8,107	8,082	9,374
Texas	115,025	116,886	119,989
East Texas	8,729	8,560	9,270
West Texas	55,813	56,153	53,027
Texas Gulf	19,941	20,732	24,860
Other Texas	30,542	31,441	32,832
Wyoming	13,820	13,247	13,971
Other Rocky Mountain	9,049	9,225	6,826
California	33,853	34,819	36,663
Foreign	†15,416	14,837	17,325
Total	260,255	262,933	276,597

*Bureau of Mines. †Includes 5,071,000 bbl. in California.

DAILY AVERAGE PRODUCTION FOR WEEK

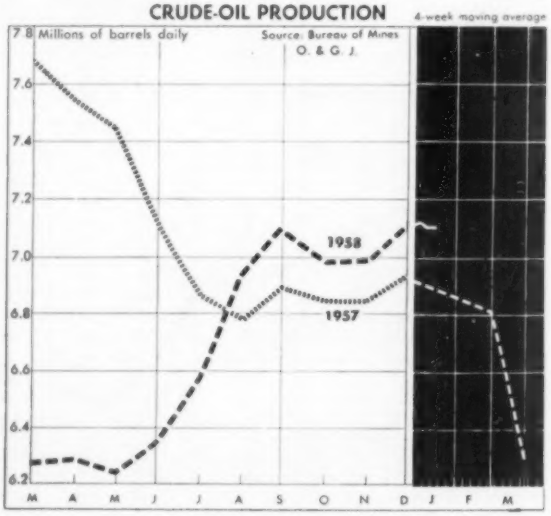
	January 17, 1959 Crude oil	Lease condensate	Total	Jan. 10 total
Alabama	15,700	.....	15,700	16,000
Arkansas	81,400	125	81,525	83,300
California	849,400	.....	849,400	850,600
Colorado	127,900	.....	127,900	128,700
Eastern	41,000	.....	41,000	41,500
Florida	1,200	.....	1,200	1,200
Illinois	229,300	.....	229,300	225,500
Indiana	32,700	.....	32,700	35,400
Kansas	†298,750	.....	†298,750	†287,486
Kentucky	63,500	.....	63,500	66,500
Louisiana	835,850	101,950	937,800	937,800
North	111,350	3,950	115,300	115,300
South	724,500	98,000	822,500	822,500
Michigan	23,400	.....	23,400	24,200
Mississippi	115,100	5,250	120,350	120,350
Montana	78,000	.....	78,000	77,300
Nebraska	59,400	.....	59,400	60,000
Nevada	100	.....	100	100
New Mexico	275,000	6,400	281,400	281,400
North Dakota	38,400	.....	38,400	37,800
Oklahoma	†536,100	.....	†536,100	†513,700
Texas	2,778,000	68,400	2,846,400	2,846,400
Dist. 1	43,000	1,600	44,600	44,600
Dist. 2	120,000	8,500	128,500	128,500
Dist. 3	383,000	33,500	416,500	416,500
Dist. 4	197,000	7,600	204,600	204,600
Dist. 5	31,000	500	31,500	31,500
Dist. 6	122,000	7,400	129,400	129,400
East Texas field	161,000	.....	161,000	161,000
Dist. 7-B	142,000	150	142,150	142,150
Dist. 7-C	140,000	3,850	143,850	143,850
Dist. 8	1,125,000	2,800	1,127,800	1,127,800
Dist. 9	210,000	1,500	211,500	211,500
Dist. 10	104,000	1,000	105,000	105,000
Utah	97,200	.....	97,200	88,400
Wyoming	336,000	.....	336,000	337,500
Others	‡325	.....	‡325	‡325
Total U. S.	6,913,725	182,125	**7,095,850**	7,061,461
Change from prev. week up	.....	.....	**34,389**	.....
Canada	†516,000	.....	†516,000	†518,400

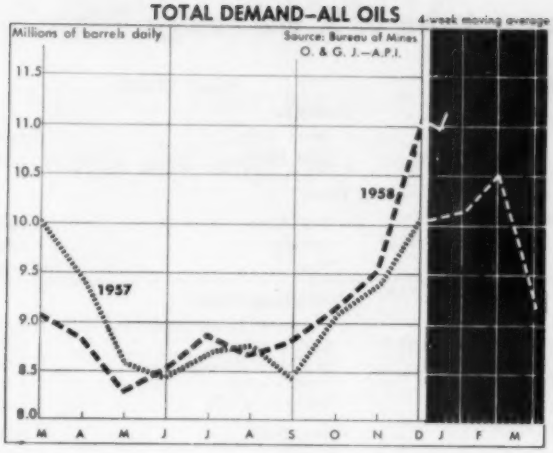
Total U. S. Prod.-Jan. 1-Jan. 17 ..... 120,438,209 bbl.
Same period last year (crude plus cond.) ..... *116,686,084 bbl.

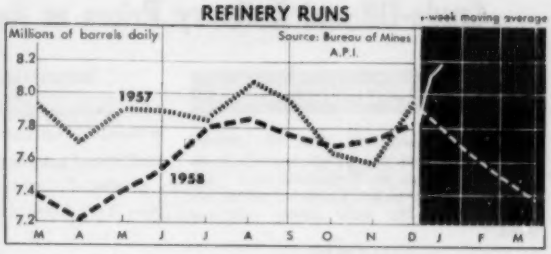
*Includes 2,728,325 bbl. condensate. †Week ended previous Monday. ‡South Dakota, Washington, and Arizona.

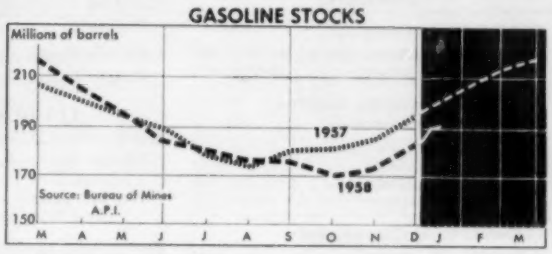
CRUDE-OIL PRODUCTION

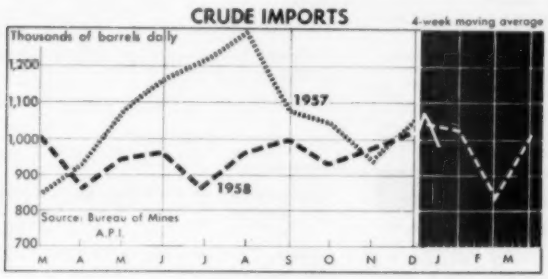
4-week moving average

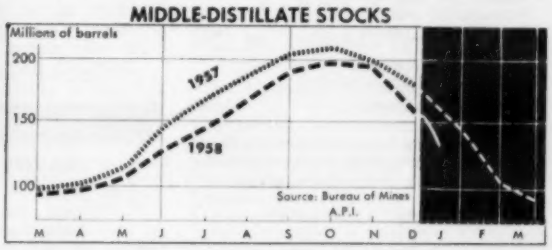


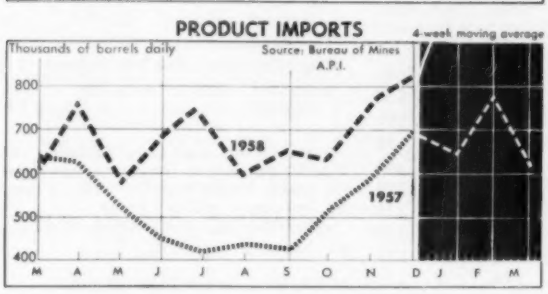

TOTAL DEMAND–ALL OILS
4-week moving average
Millions of barrels daily
Source: Bureau of Mines
O. & G. J.—A.P.I.
1957
1958
M A M J J A S O N D J F M

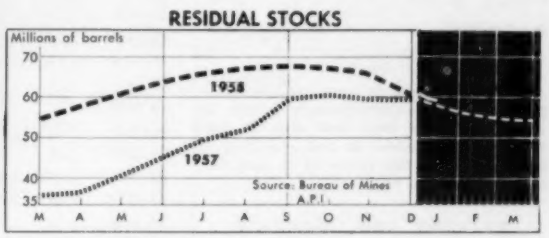












API REFINERY REPORT—JANUARY 16, 1959

(Thousands of barrels)

District—	Daily avg. runs	Daily average production—Gaso.*	Kero.	Dist.	Resid.	Stocks‡—Gaso.†	Kero.	Dist.	Resid.	Bureau of Mines, January 1958—Daily avg. runs	Daily average production—Gaso.*	Kero.	Dist.	Resid.
East Coast	1,181	528.0	43.6	410.9	230.3	41,896	10,159	38,064	11,106	1,151	502.9	35.5	338.9	194.5
Appalachian:														
District 1	107	41.1	7.0	23.9	14.2	4,644	471	2,653	323	99	40.5	4.5	25.1	9.3
District 2	115	56.7	4.4	22.8	15.4	2,657	387	942	202	93	53.4	6.8	17.4	11.1
Ind., Ill., Ky.	1,482	734.6	114.0	362.9	148.6	32,658	5,095	19,133	3,968	1,408	709.1	77.8	322.0	192.2
Minn., Wis., Dak.	113	49.1	14.3	20.7	16.0	6,689	955	5,699	567	109	50.9	5.8	29.1	13.5
Okla., Kans., Mo.	769	430.7	32.7	198.6	39.7	18,945	1,102	9,191	1,026	736	416.5	17.7	195.3	41.5
Inland Texas	272	187.9	3.7	51.0	18.4	7,682	299	1,987	2,189	277	192.4	11.1	51.3	20.8
Texas Gulf Coast	1,932	965.9	155.1	554.0	211.6	26,348	2,080	10,525	6,213	1,757	870.6	128.8	472.3	206.3
La. Gulf Coast	669	372.4	68.6	188.7	56.0	12,506	1,703	5,068	1,710	596	349.1	55.7	132.2	36.2
N. La. and Ark.	90	44.7	3.7	25.0	7.6	4,854	439	1,908	60	95	38.1	8.4	19.1	9.2
Rocky Mountain:														
New Mexico	25	13.4	0.4	4.3	2.1	636	41	164	40	23	11.3	0.3	4.3	2.7
Other Rky. Mt.	286	127.6	6.6	61.4	31.7	5,396	170	2,517	748	265	124.4	3.9	64.7	37.7
West Coast	1,088	517.6	7.9	183.1	298.3	25,837	334	11,805	31,216	1,063	467.9	5.1	169.1	313.7
Jan. 16, 1959	8,129	4,069.7	462.0	2,107.3	1,089.9	190,748	23,235	109,656	59,368	7,672	3,827.1	316.4	1,840.8	1,088.7
Jan. 9, 1959	8,245	4,098.4	443.1	2,076.0	1,078.4	190,024	25,363	119,107	59,991	.....	.....	.....	.....	.....
Jan. 17, 1958	7,675	3,817.7	387.4	1,961.9	1,018.9	200,636	25,343	135,406	57,952	.....	.....	.....	.....	.....

*At refineries including natural blended. †Finished and unfinished. ‡At refineries, bulk terminals, in transit, and in pipelines.

Crude-Oil and Refinery Prices at Representative U. S. and Foreign Points

REFINED-PRODUCT PRICES

Following quotations are for refinery products in cents per gallon moving in interstate shipments on Wednesday each week unless otherwise noted. Crude-oil prices are per barrel at the wells unless otherwise listed.

GASOLINE*

Mid-Continent (Group 3):	
Regular (89 octane)	11.50-11.625
Premium (99 octane)	14.50-14.625
Gulf Coast (cargoes for coastwise or export movements):	
Regular (90 octane)	10.00-10.25
Regular (92 octane)	10.25-10.50
Premium (97 octane)	11.375-11.625
Premium (98 octane)	11.50-11.75
California (rack) (Los Angeles):	
Regular (88 octane)	12.25
Premium (94 octane)	13.25
Premium (98 octane)	14.25
Caribbean area (cargoes):	
Regular (87 octane)	9.875
Premium (97 octane)	11.625

*Quotations are for octanes shown. Prices usually vary with octane ratings within the regular, premium, and aviation grades.

NATURAL GASOLINE*

Group 3:	
Grade 26-70	4.5
Breckenridge:	
Grade 26-70	4.0

*If 26-70 natural is considered as 100%, prices for lower-vapor-pressure grades increase 2.5% for each unit drop in Reid vapor pressure down to and including 16 lb. Prices for grades below 16 lb. may vary slightly by areas or plants.

KEROSINE AND DISTILLATE

Mid-Continent (Group 3):	
Kerosine 42-44	10.50
Diesel oil (58 d.i. and above)	10.25
Distillate No. 1	10.25
Distillate No. 2	9.50
Gulf Coast (cargoes):	
Kerosine 41-43	10.125
Distillate No. 2	9.625
New York Harbor (barges):	
★ Kerosine 41-43	11.50
★ Distillate No. 2	11.00
★ Diesel fuel, 48-52 d.i.	11.25
Caribbean area (cargoes):	
Distillate No. 2	9.625

WAX (LB.)

Oklahoma (Group 3):	
132-135 A.m.p. (semi-refined) in tank car	6.50
New York (export):	
126-130 A.m.p. crude-scale (solid in bags or barrels)	7.35

★Denotes change from previous week.

RESIDUAL FUEL (BBL.)

Mid-Continent (Group 3):	
★ Residual fuel (max. 1% S)	$1.90-1.95
Gulf Coast (cargoes):	
Bunker C fuel	$2.00
New York Harbor (barges):	
Bunker C fuel	$2.37
Caribbean (cargoes):	
Bunker C	$2.00
California (rack):	
Bunker C fuel, Los Angeles	$2.15

LUBRICATING OILS

Mid-Continent (Group 3):	
150-160 bright stock, solvent refined, 0-10 pp., 95 v.i.	23.0
200 vis. neutral oil, solvent refined, 0-10 pp., 95 v.i.	20.5
Pennsylvania Grade:	
145-155 vis. at 210, bright stock, 8 color, 25 p.t.	22
200 vis. neutral (180° at 100°), 25 p.t.	21

CRUDE-OIL PRICES

GRAVITY SCHEDULE

	Signal Hill, Calif.	Oklahoma*	Gulf Coast Tex.†	West§ Tex.‡ N.M.	Wyo. (sour)
14-14.9	$1.86	....	....	....	....
15-15.9	1.95	....	....	....	$1.81
16-16.9	2.04	....	....	....	1.86
17-17.9	2.13	....	....	....	1.91
18-18.9	2.23	....	....	....	1.96
19-19.9	2.32	....	....	....	2.01
20-20.9	2.41	$2.52	....	$2.62	2.06
21-21.9	2.50	2.55	....	2.64	2.11
22-22.9	2.60	2.58	....	2.66	2.16
23-23.9	2.69	2.61	$3.44	2.68	2.21
24-24.9	2.78	2.64	3.46	2.70	2.26
25-25.9	2.87	2.67	3.48	2.72	2.31
26-26.9	2.96	2.70	3.50	2.74	2.36
27-27.9	3.06	2.73	3.52	2.76	2.49
28-28.9	3.11	2.76	3.54	2.78	2.54
29-29.9	3.16	2.79	3.56	2.80	2.59
30-30.9	3.22	2.82	....	2.82	2.63
31-31.9	3.27	2.85	....	2.84	2.67
32-32.9	3.33	2.88	....	2.86	2.71
33-33.9	3.38	2.91	....	2.88	2.75
34-34.9	3.44	2.94	....	2.90	2.79
35-35.9	3.49	2.97	....	2.92	2.83
36-36.9	3.55	3.00	....	2.94	2.87
37-37.9	3.60	3.02	....	2.96	2.89
38-38.9	....	3.04	....	2.98	2.91
39-39.9	....	3.06	....	3.00	2.93
40-44.9	....	3.08	....	3.02	2.95

*Another Oklahoma (sweet) schedule has a top of $3.05 with different gravity variations to $2.34 for below 20°. †Low cold test crude. ‡Sour. §Some 15 cents lower, other 7 cents lower for 40°.

Effective dates of broad changes: California, 9-30-58; East of California, January 3-10, 1957; Pennsylvania Grade 12-22-58.

FLAT PRICES

Louisiana:	
Sweet Lake	$3.00
Ville Platte	3.30
Texas:	
East Texas	3.25
Conroe	3.53
Van	3.08
Pennsylvania Grade:	
Bradford	4.05
Middle District	3.87
Southwest Pennsylvania	3.58
West Virginia	3.40
Buckeye Grade	3.25
Illinois Basin	3.00
Canada:	
Leduc-Woodbend	2.67
Redwater (Alta.)	2.56
Smiley (Sask.)	2.33
Pembina	2.52

FOREIGN

Venezuela:	
Cumarebo, 48°-49.9°, Tucupido	3.66
San Joaquin, 41°-41.9°, Puerto La Cruz	3.25
Oficina, 35°-35.9°, Puerto La Cruz	3.05
Tia Juana medium, 26°-26.9°, Amuay*	2.55
Quiriquire, 16.0°-16.4°, Caripito	2.15
Lagunillas heavy, flat, Las Piedras*	2.10
Bachequero, flat, 15°-16°, Las Piedras*	1.93

Prices for all crudes of 24° or lighter vary 2 cents per degree change, up or down. All crudes heavier than 24° vary 2.5 cents per half-degree gravity change.

*Also available at La Salina at 3 cents per barrel less.

Middle East, Persian Gulf (cargoes, f.o.b. lifting port):	
Arabian, 36.0°-36.9°, Ras Tanura	$2.12
Iranian, 34.0°-34.9°, Bandar Masur	2.04
Iranian, 34.0°-34.9°, Ababan	1.99
Iraq, 35.0°-35.9°, Fao	1.98
Kuwait, 31.0°-31.9°, Mina-al-Ahmadi	1.85
Qatar, 41.0°-41.9°, Umm Said	2.23
Middle East, E. Mediterranean:	
Arabian, 36.0°-36.9°, Sidon	2.49
Iraq, 36.0°-36.9°, Tripoli, Banias	2.49
Far East (cargoes, f.o.b. Lutong, Sarawak):	
Seria Light, 37°	2.75

TANKER RATES PER LONG TON

(Latest reported spot fixtures)

★ Gulf-U.S.N.H., clean (ATRS+15%)	$3.28
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FOR SALE—6—100 Watt General Electric 2-Way radios. Van-Riner Drilling Company, 1005 City National Bldg., Oklahoma City.

FULLY EQUIPPED, shallow oil Rotary Rig mounted on Float. Three Trucks, Pipe Trailer, clean, ready to work. Owing to death of owner this equipment priced to sell. Write for invoice. Mrs. Clarence McFaull, Phone 982. P. O. Box 495, Bastrop, Texas.

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One U-15 powered by 2 NKR Waukesha engines

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150 H.P. Westinghouse Explosion Proof Motor, 1780 RPM, Frame 7755, Style 11-N89-11.

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Replies should include details on education and work experience, references, salary expected, and a small photo if available. All replies will be held in confidence.

Box L-122,
The Oil and Gas Journal,
Tulsa, Oklahoma.

CHEMICAL ENGINEERS: with experience in computer applications, preferably in refining. Send brief resume. Independent refinery, Texas Gulf Coast. Box L-129, The Oil and Gas Journal, Tulsa, Oklahoma.

TRANSLATORS. Proven ability to translate technical material into fluent English essential. Attractive full time or free-lance arrangement. All languages of interest, particularly Russian. Send resume to A.T.S., Inc., Drawer 271, East Orange, New Jersey.

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Experienced in sales of crude, L.P.G. and petroleum products. Age not a limiting factor but needs to be aggressive and competitive. Must be of executive caliber. Leads to diverse opportunities with expanding, large independent Houston concern operating in the United States, Canada and South America. Replies confidential.

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Recruiting Supervisor, Box 306

ARABIAN AMERICAN OIL COMPANY
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Experienced Drilling Superintendent, who is also fully qualified as a Petroleum Engineer, to supervise one-rig operation in Turkey. Top salary and bonus. Send complete history and references. Replies confidential.

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Superior, Wisconsin

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Director of Industrial Relations

Republic Oil Refining Company

P. O. Box 1191

TEXAS CITY, TEXAS

PETROLEUM REFINERY CHEMICAL ENGINEERS

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CABLE TOOL DRILLERS. State age, height, weight, companies worked for, rigs run and size of some holes drilled in the past ten years. Only competent, steady and non-drinking drillers need apply. Steady work. Good wages. Benefits. Write to Layne-Northwest Company, 6005 West Martin Drive, Milwaukee 13, Wisconsin.

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DUE TO CURTAILMENT in refinery personnel the following men are available: Shift Foreman, Yield Clerk, Safety Engineer, Maintenance Foreman, Warehouseman and Engineer-Draftsman. Box L-151, The Oil and Gas Journal, Tulsa, Oklahoma.

PRODUCTION—pipe line gathering system supt. 23 yrs. practical experience and operation desires responsible connection with progressive independent. Excellent references. Box L-157, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGICAL ENGINEER—Degree. Age 27. Three years experience with Electric logging Co. Prefer geological work. Available immediately. Box L-154, The Oil and Gas Journal, Tulsa, Oklahoma.

PIPELINE ENGINEER: 15 years responsibility for: Operations, Field engineering, design, development, management. Desire permanent responsible position allied with pipeline industry. Graduate PE, 39, married, will relocate. Now available. Box L-132, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST—Have found over $3 million worth of oil for Independents in the last 18 months. Permanent office in Ark.-La.-Tex. Desire contact with group with adequate financing for exploration and development. Resume on request. Box L-141, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOPHYSICIST—Nine years experience, seven states. Includes wide variety reflection techniques, some refraction, utilization of gravity and magnetics, coordinating with overall exploration effort. Degree in geology. Excellent references, will relocate anywhere. Box L-139, The Oil and Gas Journal, Tulsa, Oklahoma.

PIPELINE ENGINEER: Graduate mechanical. Ten years pipeline experience; products and gas. Desires responsible position with established company in U. S. Box L-137, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST—BS, 56. Single. Desires foreign work. Box L-158, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM ENGINEER. Six years experience in production, reservoir, drilling. Desires position with oil company in South America. Box L-153, The Oil and Gas Journal, Tulsa, Oklahoma.

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Desire position with drilling contractor or oil company with progressive drilling program. Onshore or offshore. Thorough understanding of drilling problems and mud control. P.E. Degree. Registered Engineer. Experience (12 yrs.) California, Texas and Oklahoma. Will relocate—anywhere in U. S. Good references. Resume on request.

Box L-145, The Oil and Gas Journal, Tulsa, Oklahoma.

LEASE AND DRILLING BLOCKS

PRODUCTION WANTED

PRODUCTION WANTED—Oil and Gas. We are principals, highest banking references. All submissions will be held in strict confidence. Box L-156, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Oil properties. 100 to 5,000 barrels daily in Oklahoma and Kansas. Morris Sitrin, P. O. Box 1160, Tulsa, Okla.

UNLIMITED FUNDS for purchase of oil and gas properties or producing company in North, West, West-Central Texas. Negotiations in strictest confidence. Box 743, Abilene, Texas.

RANCHES AND FARM LANDS

INFLATION PROOF—Irrigated farm land for sale, Lubbock and Parmer Counties, Texas, ½ minerals, $300.00 to $1,500.00 per acre, by owner, Rhyne Simpson, 3029 56th Street, Lubbock, Texas.

MONEY RAISING

310 ACRES OFF-SET to lime production 1,760 ft. deep. Need some drilling capital. Box 2882, Wichita, Kansas.

FINANCIAL CONTACTS, Underwriters, Brokers, Private Finders of Capital reached. No shopping. Confidential. FREE ENTERPRISE ASSOCIATES, 817—51st St., Brooklyn, N. Y.

LEASE AND DRILLING BLOCKS

WILL SACRIFICE ½ interest in producing wells, 5 state, 19 county active lease spread, preferred stock shares in Development Co., and future participation rights. Great potential. $20,600 for lot or split packages. Box L-160, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR LEASE—480 A. Roosevelt Co., Montana. Near Producers. N. Girard, 307 NE 92 Ave., Portland, Oregon.

3500 ACRES of Oil & Gas leases in Russell, Green, Adair and Clinton Counties, most on well defined structures, outright sale or drilling contracts. Write for full particulars, come or send representative to look it over. Get the facts. Want to buy good used drilling machine. Box L-143, The Oil and Gas Journal, Tulsa, Oklahoma.

450 ACRES, 6-20-12 Barton County, Kansas for ⅛ override and test well. David Fransen, 145 S. Pershing, Wichita, Kansas.

WANT SHALLOW ACREAGE for three well test program, offset or extension, preferably farmout. Write U. S. Anderson, 8350 Santa Monica Blvd., Los Angeles 46, California.

FOR SALE—Government 40 acre oil leases in Arizona, N. M. & Calif. You do no drilling yet. You share in fortunes made from oil on public lands. Payments if desired. Free information & maps of booming areas. Bids now accepted via mail. Universal Investors Corp. 30 W. Washington Street, Chicago 2, Illinois.

OWNER OF MINERALS, approximately 9,000 acres, Woodward County, Oklahoma. All under lease to major companies; solicits inquiries for sale to prospective purchasers. Box L-131, The Oil and Gas Journal, Tulsa, Oklahoma.

KENTUCKY—Boom area—6,000 acres leases; shallow drilling; no proration. All or part drilling deal. Address Box L-133, The Oil and Gas Journal, Tulsa, Oklahoma.

OIL LAND FOR LEASE

2,000 acres in Fergus County, Montana. Owner, Napoleon G. Plato, 403 N. Lucerne Blvd., Los Angeles 4, Calif. HO 5-4931.

TOO LITTLE — TOO LATE

Oil leases that could have been acquired less than one year ago in Green County, Kentucky for one dollar per acre have sold during the past 30 days for as high as $3,000 per acre. Asking price for one 157 acre tract with three wells (Less than 600 feet) is $450,000.

Most frequent complaint heard among oil men in Kentucky—"We got in here too late" or "We should have picked up more leases."

Don't let this happen to you in the next Appalachian boom area—Northeastern Ohio. See The Oil and Gas Journal pages 119 to 122, issue of Jan. 12, 1959.

More than one million acres already leased. Biggest names in the industry—including members of the "Big 10"—have moved in on 25,000 to 100,000 acre blocks, and are negotiating for more land.

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Box L-150, The Oil and Gas Journal,
Tulsa, Oklahoma.

BUSINESS OPPORTUNITIES

OKLAHOMA OIL: Some working interest for sale at $400 per ⅛ to drill shallow well soon on 80 acre lease located in West Coweta oil basin. Looks good for quick return on small investment. Write L. Snavely, Geologist, Box 315, Coweta, Oklahoma.

INTEGRATED ORGANIZATION, two geologists, major company and independent experience, one landman, independent experience. Desire financing for Anadarko Basin drilling prospects. Wildcat and semi-proven. Primarily a gas play. Prefer group investment situation with participation for ourselves. References. Box L-134, The Oil and Gas Journal, Tulsa, Oklahoma.

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Delaware Corporations formed and serviced. American Guaranty & Trust Company, P. O. Box 487, Wilmington, Delaware.

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LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Denver, Colorado. Notice is hereby given that 515.54 acres of land in four parcels within the known geologic structure of Williams Park Anticline Field, Routt County, Colorado, will be offered for oil and gas leasing through competitive bidding to the qualified bidder of the highest cash amount per acre, at 2 p. m., M.S.T., March 6, 1959, when bids will be opened. Details of the lease offering, how and where to submit bids, and forms, may be obtained from the Bureau's Land Office, P. O. Box 1018, Denver, Colorado. Louis F. Fox, Acting Land Office Manager.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Land Office, Cheyenne, Wyoming. Notice is hereby given that approximately 10,884.98 acres of land in 90 parcels within the known geologic structures of a number of fields in Niobrara and Weston Counties, Wyoming, will be offered for oil and gas leasing through competitive bidding to the qualified bidder of the highest cash amount per acre through sealed bids on or before March 5, 1959, when bids will be opened. Details of the lease offering, and how and where to submit bids, may be obtained from the Land Office, Cheyenne, Wyoming. Arvin H. Oswold, Chief, Minerals Adjudication Unit.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Denver, Colorado. Notice is hereby given that 79.76 acres of land in two parcels within the known geologic structure of Iles Field, Moffat County, Colorado, will be offered for oil and gas leasing through competitive bidding to the qualified bidder of the highest cash amount per acre, at 2 p. m., M.S.T., March 5, 1959, when bids will be opened. Details of the lease offering, how and where to submit bids, and forms, may be obtained from the Bureau's Land Office, P. O. Box 1018, Denver, Colorado. Louis F. Fox, Acting Land Office Manager.

(Continued from page 324)

Field news from Wyoming . . .

WYOMING'S new Robinson Ranch Pennsylvanian field in the northeastern Powder River basin seems to have a prolific stepout discovery. Pan American Petroleum Corp. recovered 400 bbl. of oil in 9 hours at 1 State-C, C NW SE 29-50n-67w, Crook County.

The test was of perforations at 5,986-97 and 6,007-25 ft. in Minnelusa. This well is ½ mile north of the discovery well of the field. Another well is active in the area. It is the 2 Robinson in C SW NE 32-50n-67w, a south offset try.

Denver basin . . .

DENVER BASIN 1959 success prospects brightened with the discovery is the 2 Robinson in C SW NE 32- at a Morgan County wildcat in northeastern Colorado.

McKnab Production Co. swabbed 20 bbl. of oil per hour after treating perforations in the "D" sand at 5,803-09 ft. The 1 Onken, C NW NW 15-4n-58w, is more than 1 mile west of Young field. This new strike is the first oil production in the immediate area. Young has gas production.

Testing continues at McKnab's well, and an offset, the 2 Jess, is planned.

Wyoming

HERE are some new official field names of recent discoveries in Wyoming for your records and maps.

The state field names advisory committee has labeled the following new producing areas:

. . . **Emigrant Springs.** This Lincoln County field was opened at Belfer Natural Gas Co. 1 Unit, C SE SE 21-23n-112w. Location is western Green River basin.

. . . **Lost Cabin area.** This Fremont County field was opened by The California Co. 1 Government-Langsdorf in NE NW NE Lot 2, 5-38n-91w. Location is on the north side of Wind River basin.

. . . **Playa unit-proposed,** a subdivision of Desert Springs field. This Sweetwater County discovery is Pubco Petroleum Co. 1-34 Unit, NE SW SW 34-21n-98w. Location is in Red Desert basin.

. . . **Robinson Ranch.** This Crook County wildcat discovery was Pan American Petroleum Corp.'s 1 Robinson Ranch in C NW NE 32-50n-67w, Powder River basin.

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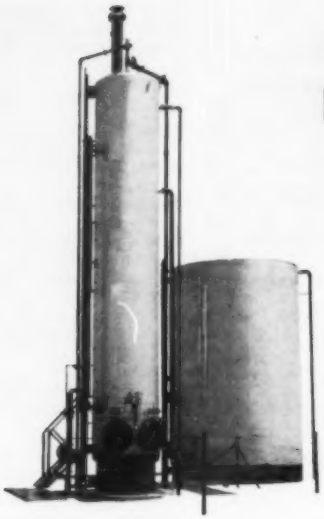

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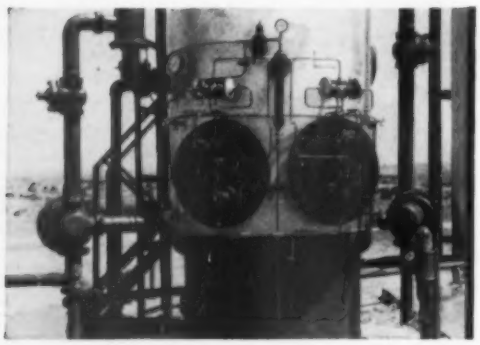

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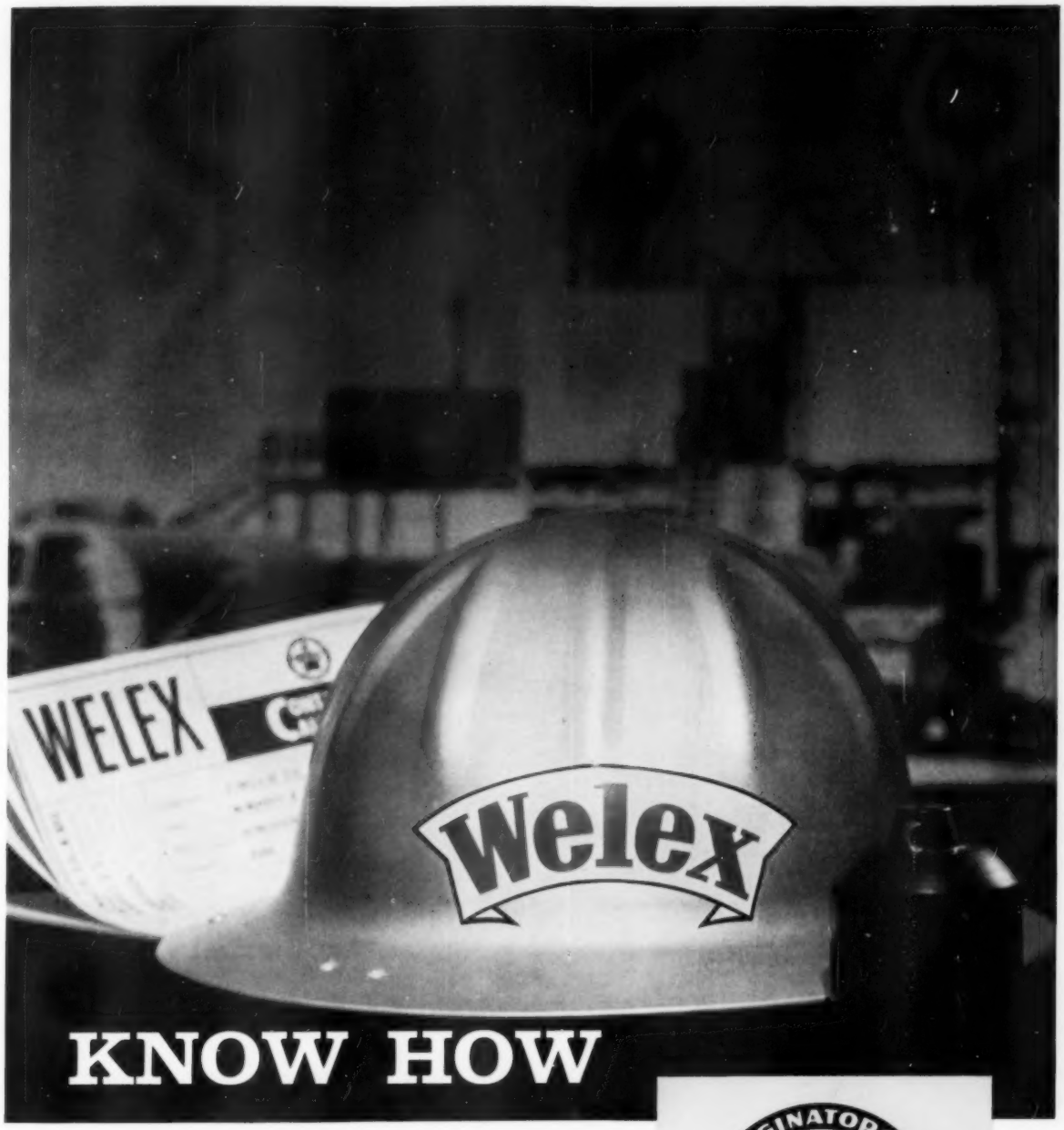

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